PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS

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DECLARATION

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Dedicated
To My Respected
Teachers, Family
& Friends

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ABSTRACT

INTRODUCTION: COPD is marked by persistent airflow limitation. Psychiatric disorders usually co-exist with chronic medical illnesses but they often remain undiagnosed. The disease severity and mental health of not only the patients but also their caregivers will determine their QOL.

AIMS AND OBJECTIVES: To assess the prevalence of psychiatric co-morbidities and the impact on the QOL in COPD patients (based on GOLD guidelines 2018) and their caregivers.

MATERIALS AND METHOD: This cross-sectional study was conducted in Dayanand Medical College & Hospital, Ludhiana on 100 GOLD 3 or 4 COPD patients and their caregivers. Psychiatric co-morbidities were assessed using the Mini International Neuropsychiatric Interview (M.I.N.I.) questionnaire and the quality of life was assessed by WHO-Quality of Life (QOL) Assessment – BREF scale.

RESULTS: The mean age of patients was 62 years, mostly males (75%). 83% were having psychiatric co-morbidity and its association increased with the severity of the grade of COPD. The prevalence of substance abuse/dependence (non-alcohol) was 57.8%, MDD was 31% and anxiety spectrum disorders was 23%. The QOL was affected in all domains (physical, psychological, social and environmental) on WHO-BREF and was poor in grade 4 than in grade 3 COPD patients.
The mean age of the caregivers was 56.16 years, mostly males (54%). Caregivers of GOLD 4 patients had higher frequency of psychiatric morbidity like depression, dysthymia and anxiety spectrum disorders (13.6%, 13.6%, 25% respectively) than caregivers of GOLD 3 patients (7.1%,7.1%,14.3% respectively). The QOL was lower for GOLD 4 than for the GOLD 3 caregiver.

CONCLUSION: The presence of psychiatric co-morbidities and its effect on QOL of both the COPD patients (severe and very severe) and their caregivers is significant and hence needs to be understood and evaluated.

KEYWORDS: COPD, psychiatric disorders, quality of life, caregivers

LIST OF ABBREVIATIONS

CES-D	Center for Epidemiologic Studies Depression Scale
COPD	Chronic Obstructive Pulmonary Disease
DALY	Disability Adjusted Life Years
DSM-IV	Diagnostic and Statistical Manual IVth edition
FEV1	Forced Expiratory Volume in 1st second
FVC	Forced Vital Capacity
GAD	Generalised Anxiety Disorder
GOLD	Global Initiative for Chronic Obstructive Lung Disease
HADS	Hospital Anxiety and Depression Scale
HARS	Hamilton Anxiety Rating Scale
HDRS	Hamilton Depression Rating Scale
HRQoL	Health Related Quality of Life
ICD-10	International Classification of Diseases 10th edition
MDD	Major Depressive Disorder
MINI	Mini International Neuropsychiatric Interview
NHLBI	National Heart, Lung, and Blood Institute
NIH	National Institute of Health
PHQ-15	Patient Health Questionnaire (15 items)
PHQ-9	Patient Health Questionnaire (9 items)
PTSD	Post Traumatic Stress Disorder
QOL	Quality Of Life
RDD	Recurrent Depressive Disorder
WHO	World Health Organisation
WHOQOL-BREF	World Health Organisation Quality of Life instrument, Short Form

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INTRODUCTION

COPD:

Chronic Obstructive Pulmonary Disease (COPD) is a continuous, progressive disease that causes productive (mucoid) cough along with wheezing and shortness of breath. It is a crucial public health challenge and is a major cause of chronic morbidity and mortality throughout the world. It is presently the fourth leading cause of death in the world [1]. About 3 million people have died due to COPD in 2012 accounting for 6% of all deaths globally. The COPD burden will increase due to continued exposure to COPD risk factors and ageing of the people [2]. It is predicted to become the third leading cause of death worldwide by 2030 [3]. In India, the prevalence of COPD has been reported to be 5% in males and 3.2% in females over 35 years of age. Cigarette smoking is the leading cause of COPD but up to 25 percent of COPD patients are the ones who never smoked [4]. Long-term exposure to other lung irritants—such as air pollution, chemical fumes, dust—also contribute to development of COPD.

As the disease progresses over time, symptoms usually become more severe. Common signs and symptoms of COPD include [5]:

- A continuous cough or a cough that produces a lot of mucus; called smoker's cough
- Shortness of breath, especially with minimal physical exertion
- Wheezing or whistling sound on breathing
- Chest tightness

The aims of COPD evaluation are to calculate the severity of airflow limitation [6], its impact on patient's health status and the risk of future exacerbations or hospitalisation. It also finds the presence of co-morbid illnesses in COPD patients which includes medical diseases like cardiovascular disease, metabolic syndrome, osteoporosis and psychiatric

diseases like depression, anxiety and substance abuse which also needs to be treated appropriately.

Spirometry is necessary to make the diagnosis of COPD. The presence of a post-bronchodilator FEV1/FVC < 0.70 confirms the presence of obstruction i.e. persistent airflow limitation. It is noninvasive, reproducible and objective measure of airflow limitation with a good sensitivity but weak specificity [7].

With the collaboration of the National Heart, Lung, and Blood Institute (NHLBI), National Institute of Health (NIH) and the World Health Organization (WHO), the Global Initiative for Chronic Obstructive Lung Disease (GOLD) [8] was implemented. The classification of airflow limitation severity in COPD (based on post bronchodilator FEV1) according to GOLD staging system (2010) is:

In patients with FEV1/FVC < 0.70:

GOLD 1: Mild FEV1 ≥ 80% predicted
GOLD 2: Moderate 50% ≤ FEV1 and < 80% predicted
GOLD 3: Severe i.e. 30% ≤ FEV1 < 50% predicted
GOLD 4: Very Severe FEV1 < 30% predicted

COPD patient and psychiatric co-morbidity:

COPD, as a chronic disease, is most oftenly associated with other co-morbidities (medical and psychiatric) that have a significant impact on its course and outcome. The average frequency of psychiatric co-morbidities (depression and anxiety being most frequent) is found to be 28.4% [9,10]. The gender-based difference in the frequency of psychiatric co-morbidities in COPD patients is also found to be statistically significant for substance abuse disorder which is generally more prevalent in males as compared to females.

The frequency of psychiatric co-morbidities in COPD patients increase with the severity of COPD (53 % in Grade IV COPD as compared to 16.67% in Grade I/II on GOLD guidelines)[11]. The frequency of psychi-

atric co-morbidities is also affected by the duration of symptoms and number of exacerbations per year. Unfortunately, psychiatric disorders are not addressed, evaluated and diagnosed in COPD patients, and as a result of it, they are not always treated adequately. This negatively affects the evolution of the respiratory disease and the patient's quality of life; it also increases healthcare and social costs [12].

COPD patient and Quality of life:

QOL is a principal domain for measuring the impact of chronic disease. As defined by WHO, "QOL is ones' perceptions of their position in life with respect to their cultural values in which they live and in relation to their goals, expectations, standards as well as concerns" [13]. QOL is an overall sense of well-being of both subjective and objective evaluations of physical, material, social and emotional well-being and personal development and purposeful activity [14].

With advancing age, COPD patients should cope with the gradual deterioration of their respiratory function and with increased psychological, social, and financial stress associated with such a progressive change [15]. Many studies have incorporated health-related quality of life (HRQoL) measurement in assessing the impact and progression of COPD. The physical domain showed a consistent deterioration of HRQoL scores associated with increased disease stage, such a trend did not seem apparent in the psychological, social, and environmental domains [16]. The care and emotional support provided by caregivers/ family members may be very crucial to improve their HRQoL, and can proactively help these patients establish a more positive outlook and healthy lifestyle.

Caregiver of COPD patient:

A caregiver is a member of a patient's social network, mostly the family, who helps them with their activities of daily living. As most of them have no specific professional caregiving training, they are often called as informal caregivers [17]. Caregivers most commonly assist patients

with impairments in old age, disability, chronic disease or a mental illness.

The predominant care for COPD patients is provided by family members (caregivers). The caregiver's burden narrates the accumulation of problems ranging from the stress involved in care-taking to social and financial problems that gradually impairs a caretaker's own professional and social life, physical and mental health, and financial prosperity. As there is a critical need for interventions for COPD patients, it is important to know what influences the health of their caregivers as well [18].

Caregiver and psychiatric morbidity:

Informal caregivers have to rely upon extended family support [19], and they become an integral part of the care support system in the home. Informal caregivers may experience anxiety, helplessness, depression, worries about the patient, uncertainty about the future, loss of mobility, and/or growing social isolation [20,21]. They may also become prey to substance abuse as a part of their maladaptive coping to the long standing problematic situation of declining health and quality of life of the COPD patient.

Caregiver and quality of life:

Caregiving is burdensome and negatively affects caregiver's QOL. The QOL worsens with the increasing severity of COPD which in turn has an impact on the COPD patient itself [22]. caregivers of patients with advanced COPD have more symptoms of anxiety and depression, and their self-rated health is significantly worse when compared with caregivers of patients with early COPD [23].

To sum up, the psychiatric co-morbidities are often under diagnosed in COPD patients and its impact on their QOL is seldom addressed. The caregivers of the such COPD patients also suffer from mental health problems which adversely affects their QOL and indirectly affects the outcome of the patient as well. As there is paucity of data in Indian

population regarding psychiatric co-morbidities in the COPD patients and their caregivers and its consequent effect on quality of their lives, hence our study aimed to assess prevalence of psychiatric morbidities in COPD patients and their caregivers and its effect on their QOL. This will enhance the knowledge and awareness on psychiatric aspects of COPD and its effect on QOL which will give way to better consultation liaison in COPD patients and their carers.

AIMS AND OBJECTIVES

- To assess the prevalence of psychiatric co-morbidities and the impact on the quality of life in COPD patients and their caregivers
- The association will be correlated to the severity of COPD (based on Global Initiative against Obstructive Lung Disease (GOLD) guidelines 2018 - GOLD 3 and 4 patients
- To determine correlates of psychiatric co-morbidities and QOL in COPD patients (grade 3 and 4) and their caregivers

REVIEW OF LITERATURE

Chronic obstructive pulmonary disease (COPD) is a major health concern caused by smoking tobacco and by household air pollution (biomass or chulha smoke) [24] .Tobacco smoking is related to consequential morbidity and mortality from non-communicable respiratory diseases (NCDs) like COPD and asthma, estimating about 6 lac people who die due to second-hand smoke every year [25].

COPD is one of the foremost non-communicable causes of death globally, as well as in India [26,27]. The involvement of COPD to the total DALYs in India increased from 4.5% in 1990 to 6.4% in 2016. Of the total global DALYs due to chronic respiratory diseases in 2016, 32.0% of them occurred in India [28]. COPD was responsible for 75.6% of the chronic respiratory disease DALYs in India in 2016 [29].

The studies from India have recognised both smoking and non-smoking-related factors in causation of COPD like outdoor air pollution from particulate matter, indoor air pollution from biomass / Chulha fuels, occupational exposure to crop dust, mine dust and chemicals. Poor socioeconomic status, poor nutrition, overcrowding, and residence in urban slums are also related to development o COPD among general population [30-32].

A study by **Miravitles et al (2009)** [33] COPD is an impairing chronic disease which is highly prevalent in people older than 40 years. It poses a large burden on the patients as well on their families, friends, and society as a whole according to study by **Chapman et al (2006)** [34].

An American study by **Thornton Snider et al (2012)** **[35]** reported that COPD was associated with a decrease in the likelihood of employment by 8.6%, and this was one of the reason for declining mental health of COPD patients and the consequent prevalence of psychiatric co-morbidities in them.

COPD and psychiatric comorbidity

The mental health disorders related with COPD not only lead to exacerbation of physical symptoms of the patient but also affect their mental and emotional well-being [36]. The association between mental disorders (depression, anxiety, schizophrenia and bipolar disorders) and chronic physical diseases such as cancer, obesity, heart disease, stroke, diabetes and (COPD) [37] has been the subject of several studies and the findings are heterogeneous in developing and emerging countries especially in India [38].

According to **Maurer et al (2008)** and **Mikkelson et al (2004),** psychiatric comorbidity in chronic medical illness like COPD has been underestimated and underdiagnosed except for prevalence studies [39,40]. The possible factors for occurrence of psychiatric comorbidities in COPD patients are psychological factors like low self-esteem, social factors such as social isolation and low productivity.

In the study by **Chaudhary et al (2016)** [41], COPD patients (mostly males with positive smoking history) had psychiatric comorbidity of 28.4% as compared to 2.7% in controls by using MINI. The frequency of those psychiatric co-morbidities increased with the severity of COPD. The frequency of co-morbidities in Grade IV COPD was 53% as compared to 16.67% in Grade I/II. The frequency was also affected by the duration of symptoms. In patients with duration of symptoms < 5 years, the frequency was 22.8% compared to the frequency of 66.67% in patients with symptoms more than 10 years ($P < 0.001$).

In Indian studies conducted by **Sharma et al (2013) [42] and Shabir et al [43],** the prevalence of psychiatric comorbidity was estimated to be around 45%.

COPD and depression

Hanania et al (2011) [44] reported COPD patients being at two- to-three fold higher risk for depression in comparison to non COPD patients.

According to **Jain et al (2009)** [45], anxiety and depressive symptoms are common in patients affected by COPD, even when their disease is mild in terms of FEV1 and respiratory symptoms. One of the hypothesis by **Norwood et al (2006)** [46] suggests that chronic hypoxemia may lead to disruptions of noradrenergic and dopaminergic synthesis, release, and replenishment that ultimately lead to depressive symptoms.

Lindberg et al (2006) [47] reported mood disorders (major depression, dysthymia) and anxiety disorders (generalized anxiety disorder, phobias and panic disorders) as commonly present in patients of COPD.

Another recent meta-analysis by **Zhang et al (2011)** [48] on COPD patients and controls found that one in four COPD patients experienced clinically significant depressive symptoms. The findings were consistent with the previous qualitative and quantitative reviews by **Van ede et al (1999), Kunik et al (2005), Mannino et al (2007)** that assessed the prevalence of depressive symptoms in COPD [49-51].

Niti et al (2007) [52] indicated high prevalence of anxiety and depression in patients with COPD (44.1%). In a review of three studies, **Solano et al. (2006)** [53] had observed the prevalence of depression ranged from 37% to 71% of COPD patients. Studies from countries like Japan (**Hayashi et al (2011))** and Turkey **(Tetikkurt et al (2011))** reported prevalence of depression in COPD patients in range of 40.5% to 46.7%. [54,55]

The study by **Negi et al (2014)** [56] found the 33% prevalence of depression in COPD patients. An Indian study from AIIMS Rishikesh by **Dua et al (2018)** [57] reported 22.4% patients with COPD had depression as the major psychiatric comorbidity followed by substance abuse.

It was found by **Goodwin et al (2011)** and **Lacasse et al (2004)** that the severity of depression in patients with COPD is closely associated with suicidal ideation [58,59]. Advanced age, low socioeconomic status may also result in social isolation and leads to more depressive feelings [60]. In patients with COPD even after adjusting the severity, de-

pression is responsible for fatigue, shortness of breath and disability [61].

COPD and anxiety spectrum disorders

Clinical anxiety is a significant problem in COPD, with an estimated prevalence of up to 40% by **Kunik et al (2005)** and **Willgoss et al (2013)** [51,62].

According to study by **Chaudhary et al (2016)** [41] , the frequency of anxiety disorders was 9.5% as compared to 1.4% in controls. Around 17.64% females had anxiety disorders compared to 7 % males, although this observation was not statistically significant. Gender based differences is concordant with **Laurin et al (2007)** in which the prevalence was 1.5 times more common in women as compared to men in patients [63].

In the study by **Sharma et al. (2013)** [42], the most prevalent psychiatric comorbidity in COPD patients was anxiety disorders (20.6%). Another study done by **Kahraman et al (2013)** [64] found that prevalence of anxiety in COPD patients was 30.7% in comparison to 16.4% in controls.

Shabir et al reported panic disorder in 9% in cases and only 3% of controls [43]. **Karajgi et al (1990)** **[65]** used Structured Clinical Interview for DSM-III-R and found prevalence of 8% for panic disorder that is 5.3 times higher than in general population. **Moore and Zebb (1999)** [66] had however found an even higher rate of panic disorder (32%) using self-report measures of panic disorder symptoms based on DSM-IV criteria for panic disorder.

Aghanwa et al (2001) and Aydin et al (2001) reported the prevalence of generalized anxiety disorder among patients with COPD in range of 10% to 15.8% when using standard diagnostic procedures [67-69] compared with lifetime rates of 3.6% to 5.1% in the general public (**Kellner et al (1992))** **[70,71]**. According to **Dowson et al (2004)** [72] the prevalence of GAD ranges 10–33% and the prevalence of panic attacks/ disorder ranges 8–67%.

Teixeira et al (2015) [73] reported that 1/3rd of COPD patients met criteria for PTSD. As COPD is often diagnosed later in life, when patients are more vulnerable to experience age-related losses (retirement, death of loved ones, diminishing social networks), it increases feelings of loneliness and trigger symptoms of depression and anxiety [74].

Correlation with severity of COPD

In the study by **Chaudhary et al (2016)** [41], the frequency of psychiatric comorbidities increased with the severity of COPD (more in severe and very severe COPD). There was an obvious difference in the frequency of psychiatric comorbidities with duration of symptoms of COPD ($P < 0.001$)- 67% of patients with duration of >10 years and 23% patients with duration of ≤5 years.

Gudmundsson et al (2006) [75] suggested that depression and anxiety have major implications on QOL, increased frequency of admissions and prolonged length of stay. In a systematic review by **Wagena et al (2004)**, the prevalence of depression in patients with moderate-to-severe COPD ranged 7–42% [76,77].

In a study by **Asuka et al (2013)** [78], it was found that there was a weak correlation ($r = -0.29$, $P = .01$) between the severity of airflow limitation (FEV1), and the CES-D score. The prevalence of depression increased with BODE staging, reported being 12.5% in stage 1, 45.5% in stage 2, 38.2% in stage 3 and 75% in stage 4 ($P = .02$). Using the SGRQ to assess HRQoL, a significant correlation was found between the presence of depression and the domains of life.

There are studies reporting that the severity of lung function affects depression with prevalence of depression in severe stages of COPD has ranged from 24% to 42% in international studies, and from 30% to 36% in previous studies from Japan [79-85].

Van Manen et al (2002) [79] assessed the prevalence of depression with severity of lung function in COPD patients, using the CES-D and found that prevalence of depression is 19.6% in patients with mild to

moderate COPD and 25% in patients with severe COPD, suggesting an association between the severity of lung function and depression.

Dowson et al (2001) [86] reviewed the prevalence of depression and anxiety using the HADS in COPD patients and found that those with more severe COPD had higher scores of depression and anxiety. **An et al (2010)** [87] and **Funk et al (2009)** [88] showed that increasing severity of COPD in patients was related to more likelihood of depression.

COPD and QOL

With respect to the relationship between psychological status and QOL, in a study in Japan by **Hajiro et al (2000)** [89]**,** reported an association between depression and QOL that with depression QOL declines.

Quint et al (2008) [90] and **Balcells et al (2010)** [91], stated that the presence of depression tends to decrease QOL when measured using the SGRQ, thus implying that depression is significantly related to QOL.

The study by **Christian et al (2015)** [92] found that the prevalence of anxiety on HADS-A (84.9 %) and depression on HADS-D (58.8%); PHQ-9: (60.6%) was higher in moderate to very severe COPD. The frequency of somatisation (PHQ-15: 81.8 %) was also found to be higher in comparison to the general population (PHQ-15: 9.3 %) [93-95].

COPD puts a significant impact on QOL of patient [96]. Comorbidity is associated with higher levels of hospitalisation, poly-pharmacy, poor quality of life and higher mortality [97]. HRQoL is a multifaceted concept linked to health or illness. It includes a number of distinct domains corresponding to the physical, social, and psychological impact of illness [98].

Balcells and colleagues in 2010 [91] reported Age as one of the most important factors affecting COPD patients' QOL. Gender, marital status, socioeconomic and employment status, as well as maladaptive coping behaviors such as smoking are other factors determining the

patients' psychological distress. A considerable number of systematic reviews in **2011 (Martinez et al and Miedinger et al)** suggest that symptoms of depression and anxiety are associated with poorer HRQoL in COPD [99-101].

A review by **Blakemore et al (2014)** [102] examined the impact of depression and anxiety on HRQoL with time and found that presence of depression and anxiety at baseline were significantly associated with worsening levels of HRQoL at 1 year follow-up (r=0.48, 95% CI 0.37–0.57, P<0.001; r=0.36, 95% CI 0.23–0.48, P<0.001; for depression and anxiety, respectively).

In a population-based sample of those with and without COPD (n=476), **Lu et al (2012)** [103] found that stress related to decreased energy, anxiety, and fear/panic in response to breathing difficulties was associated with increased depressive symptoms and impaired QOL among patients with COPD compared to age-matched controls.

Andenaes et al (2004), Yohannes et al (2005), Gudmundsson et al (2005) reported anxiety and depression as common co-morbidities of COPD which had relationship with exacerbations of COPD and QOL of the patient [104-107].

The incidence of depression, in a recent longitudinal study by **Schneider et al 2010** [108] (n = 35,000 COPD patients) with a follow-up of 10 years was 16.2 cases per 1000 person-years in the COPD group compared to 9.4 cases per 1000 person-years in the non-COPD control group which also varied with the severity of COPD, being twice the likelihood in severe COPD than the mild cases [109].

A study by **Einser and colleagues 2010** [110] reported that COPD patients are 85% more likely to develop anxiety disorders compared to healthy, matched controls. COPD patients with comorbid anxiety disorders are twice as likely to exhibit lower self-esteem, predispose to suicidal ideation, and deteriorating QOL. Presence of irritability and hope-

lessness in COPD patients also decrease the quality of life in these patients [111].

The most frequent psychiatric comorbidity in study by **Chaudhary et al (2016)** [41] was substance abuse disorder (16.21%), followed by dysthymia (5.7%) and depression (2.7%) with a frequency of nearly 19.3% in males as compared to 0% in females (P = 0.047) which all led to decrease in QOL of COPD patients.

Caregiver

Most people with COPD in India live in a community in which relatives and friends (informal caregivers) are the main care providers as stated by a review by **Caress et al (2009)** and others [112-114].Caregiving is physically, emotionally, and financially demanding work, with a high burden and poor QOL [115-116].

A study of Brazil by **Pinto et al (2007)** [117] observed that 85% of caregivers of patients with COPD were female with a mean age of 51 years. Majority had low levels of income and schooling [118].

Trivedi et al (2012) [119] reported that patients and caregivers have a bidirectional impact on the physical and mental well-being and QOL as well. A caregiver is associated with better adherence, a reduced rate of smoking, and less frequent emergency visits in COPD patients as compared with those for patients living alone [120].

In a study by **Gautun et al (2012)** [121], caregivers are mostly female spouses. A **Spanish survey of 2013** [122] reported females as more likely to take responsibility when a caregiving situation arises and caregiving is still considered as a woman's job [123-126]. Patients often report that COPD affects their family life and relationship of the patient and caregiver may also be affected. In a study by **Kuprys et al (2014)** and **Simpson et al (2010),** 16% of couples declared that smoking had a negative impact on their relationship [127,128].

Caregiver and psychiatric morbidity

A study by **Gautun et al (2012)** [121] and **Giacomini et al (2012)** [129] recorded that informal caregivers experience anxiety, helplessness, depression, uncertainty about the future and social isolation.

Lee et al (2010) [130] showed that depression and anxiety are major concerns in caregivers of COPD. **Cain and Wicks (2000)** [131] showed that caregivers younger than 55 years of age reported greater burden than the older ones. Similar levels of burden were described in male versus female and spouse versus non spouse caregivers. **Pinto et al (2007)** [117] stressed that caregiving in COPD causes a significant impact on the QOL of caregivers and the most important predictor of COPD burden was the relationship between caregivers and patients. The quality of the relationship between caregivers and patients is an important predictor of caregiver burden and history of relational stress, conflict and instability also increase the risk of caregiver vulnerability.

Drageset and Lindstorm (2005) [132] showed that low educational levels were related to a higher frequency of clinically significant anxiety and depression symptoms, helping carers to positively cope with the caregiving demands and contributing to their overall well-being.

According to study by **Miravitlles et al (2015)** [126] feeling tired was the most frequent health related problem, followed by feeling depressed. **Lee et al (2010)** [130] described psychosocial conditions of caregivers in relation to leisure problems. Having to reduce leisure time, not being able to go on holidays, and difficulty in seeing friends, having conflict with a partner and not having time for friends and for self-care were the most prevalent problems.

In a study by **Miravitlles et al (2003),** caregivers younger than 65 years, described not being able to work out of the home or having economic problems which highlighted the large economic burden of COPD on the caregiver [133,134]. The probability of presenting work-related problems is 16.8%, 17.2%, and 27.2% in caring for patients with mod-

erate, severe or great dependence, respectively (compared with non-dependent subjects) [[126]].

Caregivers experienced losses in terms of social life, and experience anxiety, helplessness, depression, worries about the patient, uncertainty about the future, loss of mobility, and growing social isolation.[116,129] caregivers' QOL, in turn, has an impact on the COPD patient as demonstrated by **Kuhn et al (2008)** [135].

Covinsky et al (2003), Berg et al(2005) and **Grant et al (2012)** emphasised that severity of symptoms like fatigue, coughing and anxiety were rated higher by informal caregivers than by the patients [136-138]. The frequencies of anxiety (63.5%) and depression (34%) symptoms in family carers of patients with COPD are in line with those observed in family carers of people with dementia, stroke, or cancer, highlighting the demanding and stressful nature of the caregiving role in COPD [139].

Gender was also a significant predictor of anxiety. Research by **Perz et al (2011)** [140] suggests that female carers experience higher levels of physical and emotional stress, subjective burden, and lower levels of physical health when compared to male carers.

Caregiving and severity of COPD

Figueiredo et al (2014) [141] demonstrated that caring for people with advanced COPD reported higher subjective burden, more depression, and poorer self-rated mental health than did those caring for people with early COPD.

According to **Nordtug et al (2013)** [142]**,** perceived extended support was negatively associated with the patient's disease severity. Informal caregivers who perceive less support from family and friends are more likely to experience loneliness and depression and this declining social environment and social support are common with increasing disease severity [143].

A study by **Simpson et al (2008)** [144] highlighted that caregivers, as well as patients, may experience a decline in psychological and physical functioning, towards the advanced stages of COPD. In fact, caregivers of patients with advanced COPD (grade 3 and 4 of GOLD staging system) had more symptoms of anxiety and depression, and their self-rated health and QOL was significantly worse when compared with caregivers of patients with early COPD (stage 1 and 2) [145].

Similar study by **de Miranda et al (2007)** [146] including patients with severe and very severe COPD and their relatives showed that 72% of the caregivers had symptoms of anxiety and 26% had symptoms of depression at the point of discharge from the hospital.

A study by **Detering et al (2010)** [147] highlighted that family members of elderly patients who received facilitated advance care planning had fewer symptoms of PTSD, depression and anxiety compared with family members of patients receiving usual care.

Caregiver and QOL

Patients and caregivers may have different perceptions of the patients' health status which has a negative influence on the caregivers' QOL as reported by **Janssen et al (2012) and Gutman et al (2003)** [148,149]**.**

Spence et al (2008) [150] showed that caregivers have gradual deterioration in health and QOL themselves. **Pinnock et al (2011)** [151] concluded that patients and carers accepted the debilitating symptoms of a COPD but uncertainty about the outcome and prognosis of the disease caused stress to the patient and the informal caregiver.

In the study by **Jácome et al (2014)** [152] it was found that family carers have significant anxiety and depression symptoms, and their subjective burden, female gender, older age, and patient’s activities limitation were significant predictors of these distressing symptoms and consequent QOL.

Contrarily to a research, no statistically significant differences were found for both anxiety and depression symptoms considering the kin relationship with the patient [153,154]. **Dupuis et al (2004)** [155] suggested that although spouses have been identified as the highest risk group for distress among all carers, children, particularly adult daughters, are also intensely affected by their caregiving responsibilities. Adult daughters have often to balance several demanding roles at the same time (e.g., spouse, mother, worker, carer, and friend), which can lead to high levels of stress and poor psychological health and hence QOL [156,157].

Ng et al (2009) [158] showed that the functional decline contributes to the development of carers' subjective burden which, in turn, affects their psychological health and QOL. This is particularly remarkable for depression, since those who were caring for people with advanced COPD (severe and very severe) presented higher clinically significant depression symptoms. This result was expected since patients at advanced COPD experience a higher degree of physical disability and, thus, an increasing dependence on their family carers. Conversely, a study by **Boyle et al (2009)** [159]**,** no differences on anxiety symptoms between early and advanced COPD were found although the decline of QOL was present.

To summarise, as per the existing literature, psychiatric co-morbidities are frequently seen in COPD patients which deteriorates their QOL in all domains of physical, psychological and social health. Similarly, the caregivers of such COPD patients also suffer from mental health problems which impacts their QOL. As the severity of the COPD increases, the frequency of association of psychiatric co-morbidities increases both in patient and his caregiver and their QOL becomes poorer with increasing grade of COPD. As there is dearth of Indian data on this concern, our study aims to assess the prevalence of psychiatric co-morbidities in severe and very severe cases of COPD patients and their carers and its impact on their QOL. This will guide us in better ap-

proach to COPD patients, early screening and timely psychiatric intervention which will improve their mental health and subsequently their QOL.

MATERIALS AND METHODS

Source of Data

The diagnosed cases of COPD- GOLD 3 or 4 and their caregivers will be included from the outpatient and inpatient department of General Medicine and Pulmonary Medicine of Dayanand Medical College & Hospital, Ludhiana, after taking an informed written consent both from the patient and the caregiver.

METHOD OF COLLECTION OF DATA

This hospital based, cross-sectional study will be conducted in Dayanand Medical College & Hospital, Ludhiana. A total of 100 COPD patients- GOLD 3 or 4 and caregivers of the patients will be included in the study.

INCLUSION CRITERIA

- Age between the range 25-70 years.
- diagnosed cases of severe and very severe COPD i.e. grade 3 and 4 as per Global Initiative against Obstructive Lung Diseases (GOLD) 2018 guidelines.

EXCLUSION CRITERIA-

- Who are below 25 years or above 70 years of age
- Who do not consent for the study
- Who have a primary psychiatric illness

TOOLS

1. **Mini International Neuropsychiatric Interview questionnaire** for the assessment of the psychiatric co-morbidities. The Mini-International Neuropsychiatric Interview (M.I.N.I.) version 5.0.0 is a short structured diagnostic interview, developed jointly by psychiatrists and clinicians in the United States and Europe, for DSM-IV and ICD-10 psychiatric disorders. It is divided into 16 modules-identified by letters, each corresponding to a diagnostic category. With an administration time of approximately 15 minutes, it was de-

signed to meet the need for a short but accurate structured psychiatric interview for multicenter clinical trials. Overall, the MINI diagnoses are characterised by good kappa values. The operating characteristics of the MINI are also good. Sensitivity is 0.70 or greater for all but three values (dysthymia, obsessive compulsive disorder and current drug dependence). Specificities, negative predictive values and efficiency scores are 0.85 or higher across all of the diagnoses. Positive predictive values are high for major depression, lifetime mania, current and lifetime panic disorder, lifetime agoraphobia, lifetime psychotic disorder, anorexia and post-traumatic stress disorder (PTSD). Inter-rater and test-retest reliabilities are good [184].

2. The quality of life will be assessed by **WHO-Quality of Life Assessment – BREF scale** [13]**.** It consists of 26 items. Each item uses a Likert-type five-point scale. These items are distributed in four domains. The 4 domains of QOL are:-

(a) physical health and level of independence (seven items assessing areas such as presence of pain and discomfort; dependence on substances or treatments; energy and fatigue; mobility; sleep and rest; activities of daily living; perceived working capacity).

(b) psychological well-being (eight items assessing areas such as affect, both positive and negative self-concept, higher cognitive functions, body image and spirituality).

(c) social relationships (three items assessing areas such as social contacts, family support and ability to look after family; sexual activity).

(d) environment (eight items assessing areas such as freedom; quality of home environment; physical safety and security and financial status; involvement in recreational activity; health and social care: quality and accessibility).

Domain scores are scaled in a positive direction (higher scores denote higher quality of life). The mean score of items within each domain is used to calculate the domain score. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100. The WHOQOL-BREF has been shown to display good discriminant validity, content validity and test-retest reliability. Domain scores produced by the WHOQOL-BREF have been shown to correlate at around 0.9 with the WHOQOL-100 domain scores [185].

3. **Socio demographic proforma** will include the name of the patient, age, gender, MRD number, occupation, education, income, marital status, duration of COPD, grade/severity, history of smoking, address, contact number, psychiatric co-morbidity ; name, age, gender, relation of the caregiver, duration of living together, contact number, score on WHOQOL-BREF.

OBSERVATIONS AND RESULTS

TABLE 1- AGE WISE DISTRIBUTION OF COPD PATIENTS

Age	Mean	Standard deviation	Percentage (%)
25-35 yrs	0	0	0 (no patient)
36-45 yrs	40.60 years	3.92 years	15
46-55 yrs	50.45 years	3.57 years	24
56-70 yrs	**62.08 years**	**10.16 years**	**61**

Table shows majority of the patients were in age group of 56-70 years.

FIGURE 1- AGE WISE DISTRIBUTION OF COPD PATIENTS

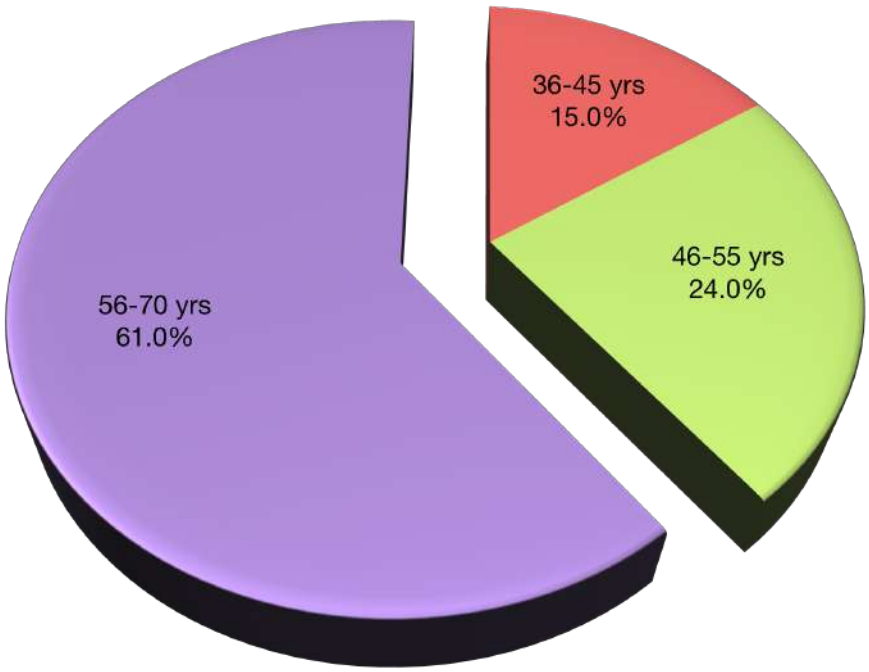


Table 2- GENDER WISE DISTRIBUTION OF COPD PATIENTS

Gender	Percentage %
MALE	75
FEMALE	25

Table shows majority of the patients were males.

FIGURE 2- GENDER WISE DISTRIBUTION OF COPD PATIENTS

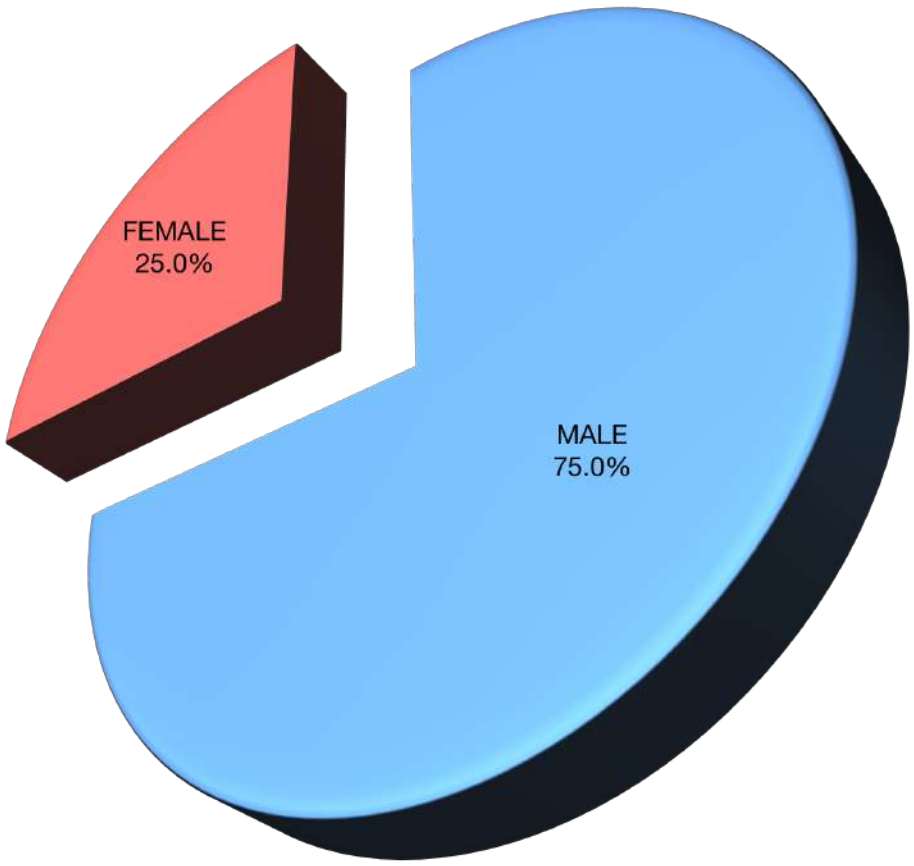


FIGURE 3-DISTRIBUTION OF COPD PATIENTS ACCORDING TO OCCUPATION

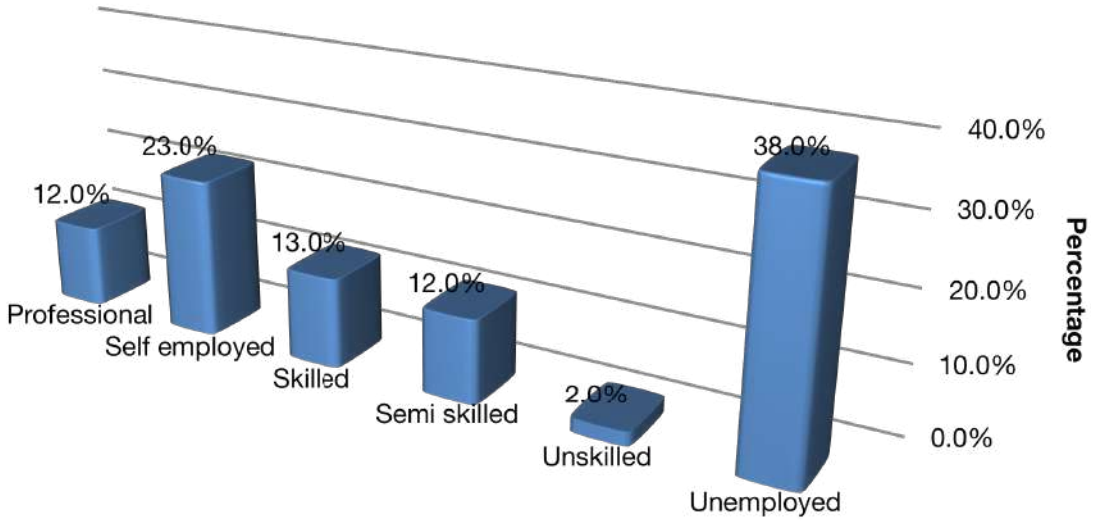


Figure shows majority patients were currently not working (retired / unemployed)

FIGURE 4- DISTRIBUTION OF COPD PATIENTS ACCORDING TO EDUCATION LEVEL

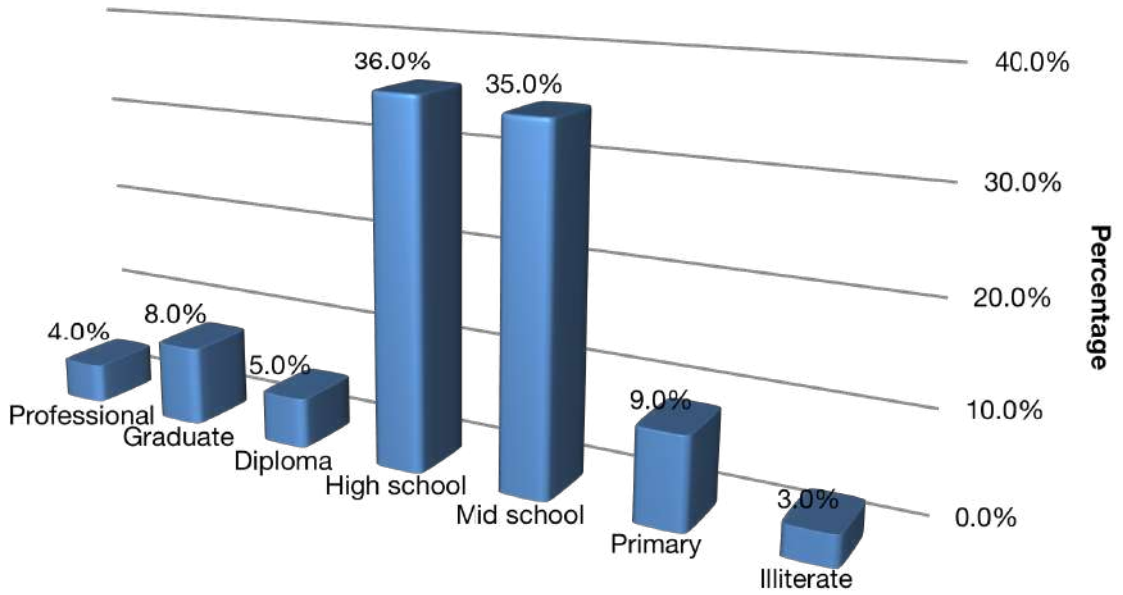


Figure shows majority patients were educated.

Table 3- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO MARITAL STATUS

Marital Status	Percentage %
MARRIED	83
DIVORCED/ WIDOW/WIDOWER	17

Table shows most patients were married.

FIGURE 5- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO MARITAL STATUS

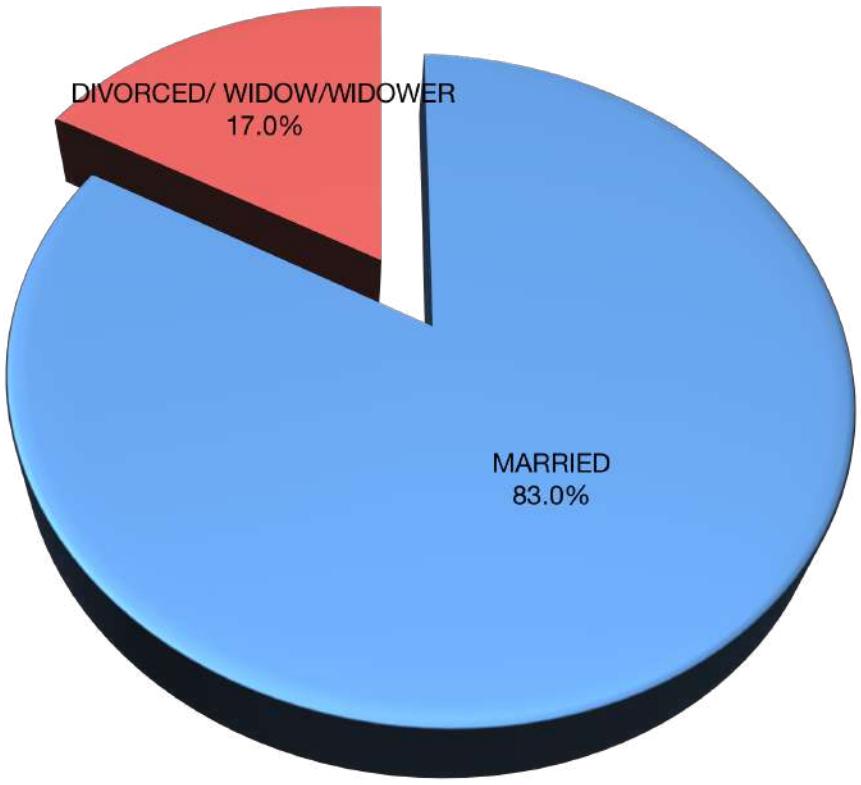


Table 4- DISTRIBUTION OF PATIENTS BASED ON SEVERITY OF COPD- GOLD STAGING

Grade/ Severity	Percentage %
GOLD 3 SEVERE	55
GOLD 4 VERY SEVERE	45

Table shows majority of the patients in the study sample were of GOLD 3 stage.

FIGURE 6- DISTRIBUTION OF PATIENTS BASED ON SEVERITY OF COPD- GOLD STAGING

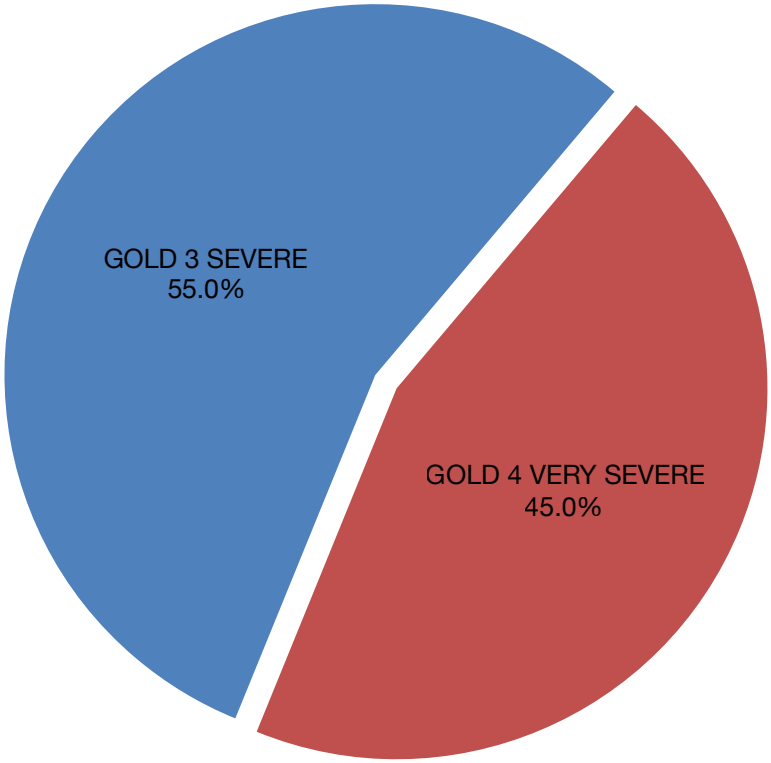


FIGURE 7- DISTRIBUTION OF PATIENTS WITH RESPECT TO DURATION OF COPD

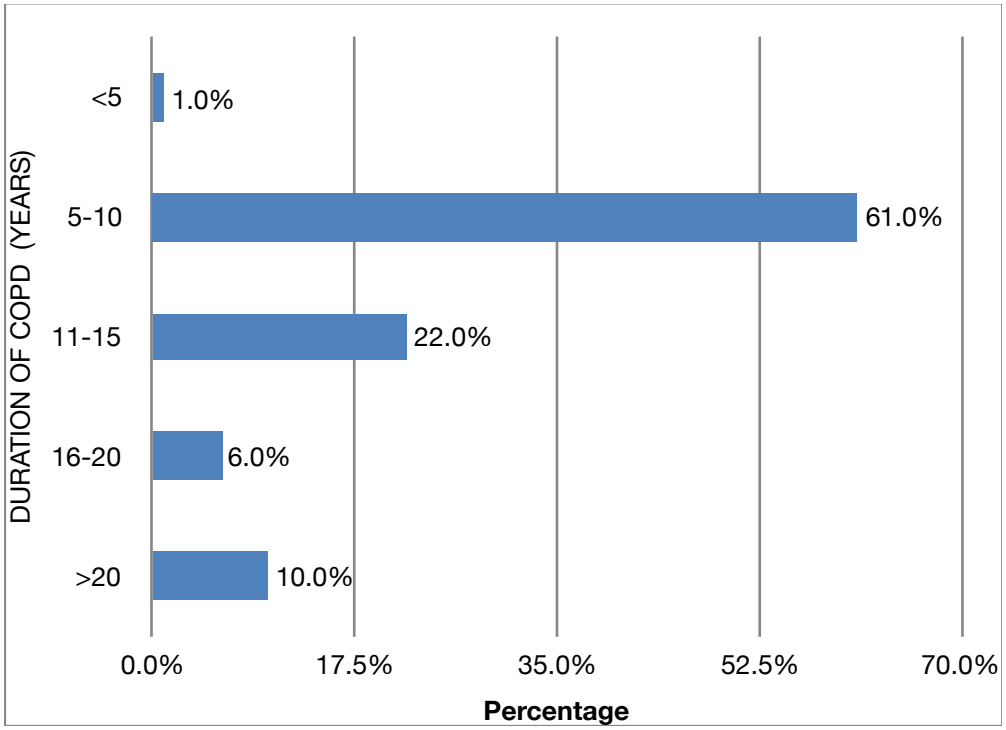


Figure shows majority COPD patients had duration of illness in range of 5-10 years

Table 5- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO HISTORY OF SMOKING (CURRENT SMOKERS)

History of Smoking	No. of cases	Percentage
YES	42	42.0%
NO	58	58.0%

Table shows positive smoking history in 42% of the patients (current smokers).

FIGURE 8- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO HISTORY OF SMOKING

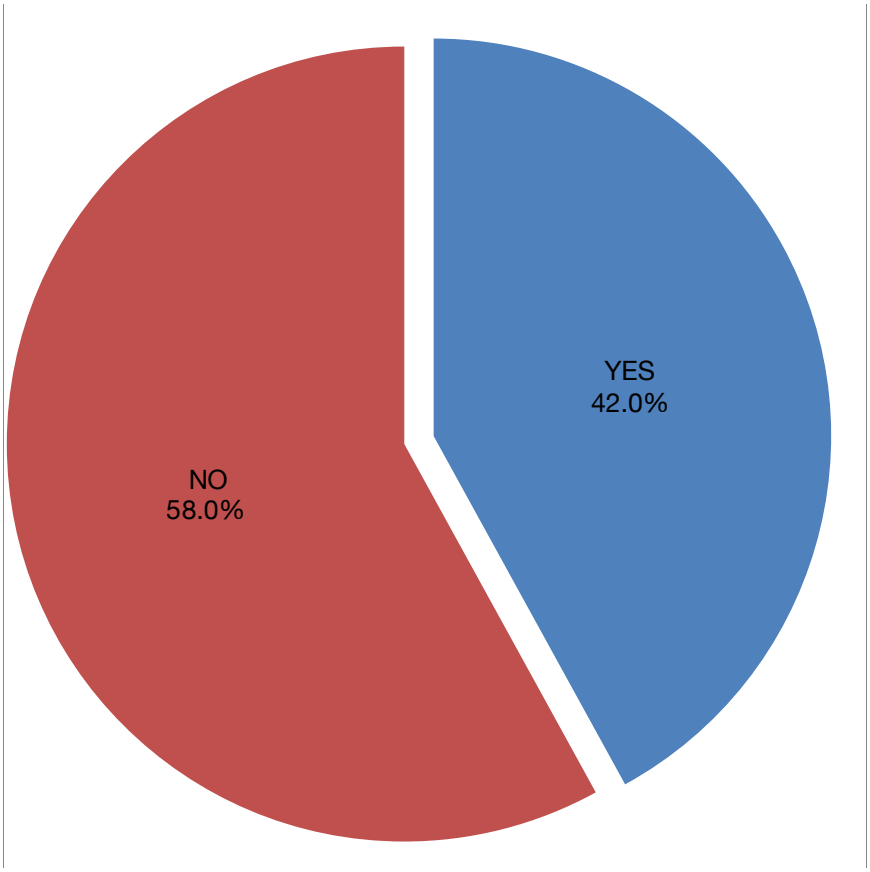


Table 6- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO PSYCHIATRIC COMORBIDITY

Psychatric morbidity	No. of cases	Percentage
NO	17	17.0%
YES	**83**	**83.0%**

Table shows presence of psychiatric comorbidity in 83% of the patients

FIGURE 9- DISTRIBUTION OF COPD PATIENTS WITH RESPECT TO PSYCHIATRIC COMORBIDITY

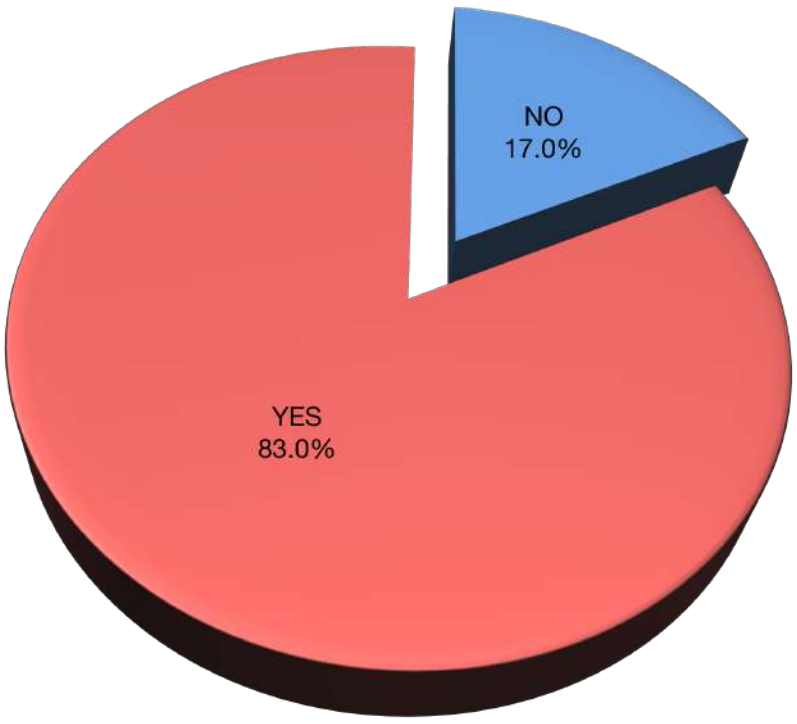


Table 7- RELATION OF PRESENCE OF PSYCHIATRIC COMORBIDITY WITH GRADE OF COPD

		Psychiatric CoMorbidity				Total	Chi-square value	p-value
		NO		**YES**				
Grade/ Severity	Severe	17	100.0%	**38**	**45.8%**	55	16.758*	**0.0001**
	Very severe	0	0.0%	**45**	**54.2%**	45		
Total		17	100.0%	**83**	**100.0%**	100		

Table shows psychiatric comorbidity in patients was significantly related to the increasing severity of the grade of COPD.

Table 8- RELATION OF PSYCHIATRIC COMORBIDITY WITH GRADE OF COPD

		Grade/ Severity				Total	Chi-square value	p-value
		GOLD 3 SEVERE		GOLD 4 VERY SEVERE				
MINI_major depressive disorder/ recurrent depressive disorder	**NO**	**46**	**83.6%**	**23**	**51.1%**	**69**	**12.241***	**0.001**
	YES	**9**	**16.4%**	**22**	**48.9%**	**31**		
dysthymia	NO	49	89.1%	37	82.2%	86	0.970	0.325
	YES	6	10.9%	8	17.8%	14		
sucidality	NO	54	98.2%	44	97.8%	98	0.021	0.886
	YES	1	1.8%	1	2.2%	2		
manic episode	NO	54	98.2%	45	100.0%	99	0.826	0.363
	YES	1	1.8%	0	0.0%	1		
panic attack/ disorder	NO	53	96.4%	39	86.7%	92	3.162	0.075
	YES	2	3.6%	6	13.3%	8		
agoraphobia	NO	54	98.2%	42	93.3%	96	1.515	0.218
	YES	1	1.8%	3	6.7%	4		
social phobia	NO	54	98.2%	45	100.0%	99	0.826	0.366
	YES	1	1.8%	0	0.0%	1		
obsessive compulsive disorder	NO	55	100.0%	45	100.0%	100		
post traumatic stress disorder	NO	55	100.0%	45	100.0%	100		
alcohol abuse/ dependence	NO	43	78.2%	41	91.1%	84	3.078	0.079
	YES	12	21.8%	4	8.9%	16		
substance abuse / dependence (non alcohol)	**NO**	**40**	**72.7%**	**19**	**42.2%**	**59**	**9.521***	**0.002**
	YES	**15**	**27.3%**	**26**	**57.8%**	**41**		
psychotic disorder	NO	54	98.2%	45	100.0%	99	0.826	0.366
	YES	1	1.8%	0	0.0%	1		
Anorexia nervosa	NO	55	100.0%	45	100.0%	100		
Bulimia nervosa	NO	55	100.0%	45	100.0%	100		
generalised anxiety disorder	NO	51	92.7%	39	86.7%	90	1.010	0.315
	YES	4	7.3%	6	13.3%	10		
antisocial personality	NO	55	100.0%	45	100.0%	100		

Table shows Significant association of MDD/RDD and substance abuse/ dependence (non alcohol) with increasing severity of COPD in patients.

FIGURE 10- PRESENCE OF PSYCHIATRIC COMORBIDITY IN COPD PATIENTS

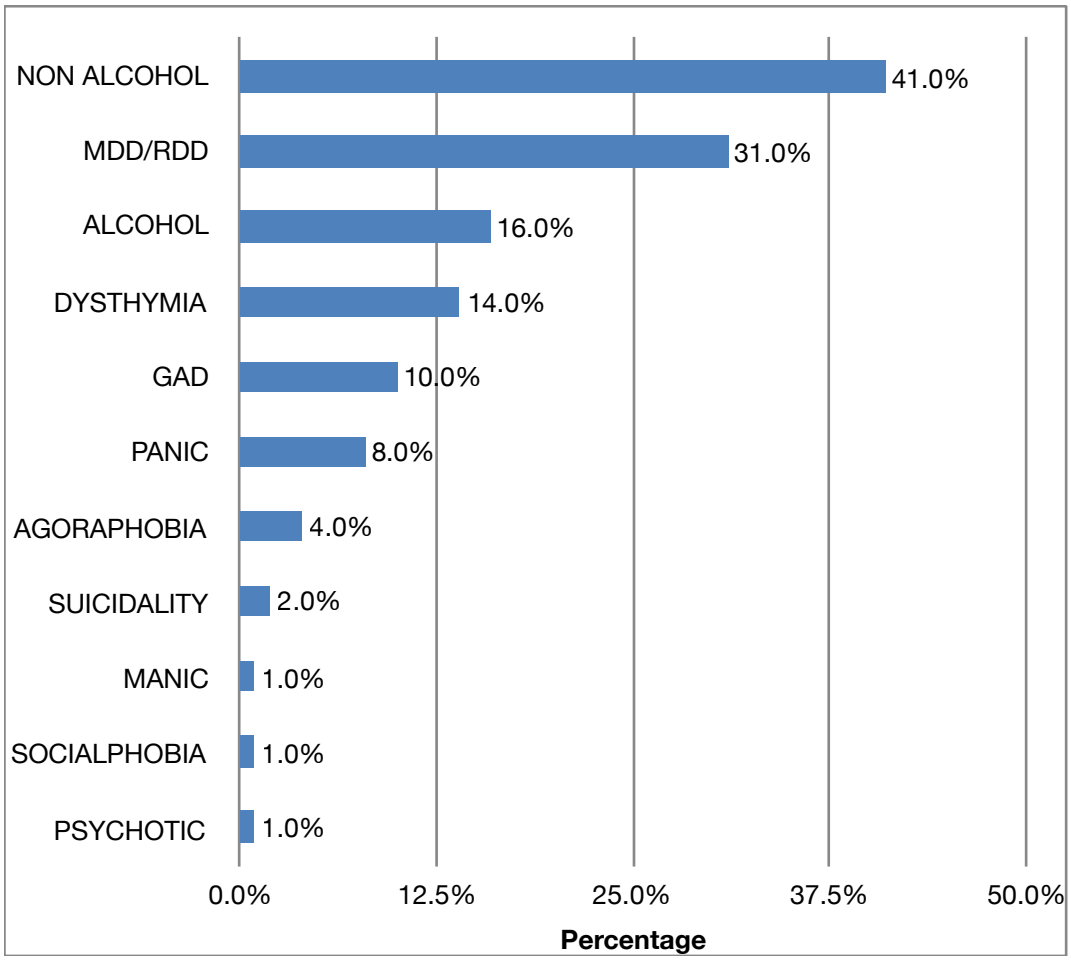


Figure shows substance abuse/dependence (non alcohol) and MDD/RDD as most frequent psychiatric comorbidity in COPD patients.

Table 9- RELATION OF PSYCHIATRIC COMORBIDITY WITH DURATION OF COPD

		Psychiatric coMorbidity				Total	Chi-square value	p-value
YEARS		NO		YES				
Duration of COPD	<5	1	5.9%	0	0.0%	1	16.348*	**0.003**
	5-10	**16**	**94.1%**	**45**	**54.2%**	**61**		
	11-15	0	0.0%	22	26.5%	22		
	16-20	0	0.0%	6	7.2%	6		
	>20	0	0.0%	10	12.0%	10		
Total		17	100.0%	83	100.0%	100		

Table shows that the frequency of presence of psychiatric comorbidity in COPD patients increase with increasing duration (chronicity) of the disease.

Table 10- WHO QOL BREF scores of COPD patients

	WHO QOL BREF	N	Minimum	Maximum	Mean	Std. Deviation
	Domain 1 transformed score (0-100)	100	19	69	46.00	12.90
	Domain 2 transformed score (0-100)	100	25	69	44.48	11.26
	Domain 3 transformed score (0-100)	100	25	75	48.51	14.21
	Domain 4 transformed score (0-100)	100	25	69	51.83	9.91

Table shows mean scores on domains of WHO QOL BREF in COPD patients.

Table 11-comparison of WHO QOL BREF scores with respect to severity of COPD

	Grade/ Severity	GOLD 3 SEVERE		GOLD 4 VERY SEVERE		t	p-value	Difference		95% Confidence Interval of the Difference	
		Mean	SD	Mean	SD			Mean	Std. Error	Lower	Upper
1	PHYSICAL DOMAIN	53.11	10.92	37.31	9.38	7.662*	**0.002**	15.80	2.06	11.71	19.89
2	PSYCHOLOGICAL DOMAIN	49.07	11.77	38.87	7.52	5.034*	**0.001**	10.21	2.03	6.18	14.23
3	SOCIAL RELATIONSHIP DOMAIN	54.09	14.79	41.69	9.97	4.801*	**0.015**	12.40	2.58	7.28	17.53
4	ENVIRONMENTAL DOMAIN	54.09	11.06	49.07	7.52	2.595*	**0.011**	5.02	1.94	1.18	8.87

Table shows significant relationship of QOL on all domains in COPD patients with increasing severity of disease i.e. QOL of grade 4 COPD patients was worse than grade 3 COPD patients.

FIGURE 11-comparison of WHO QOL BREF scores with respect to severity of COPD

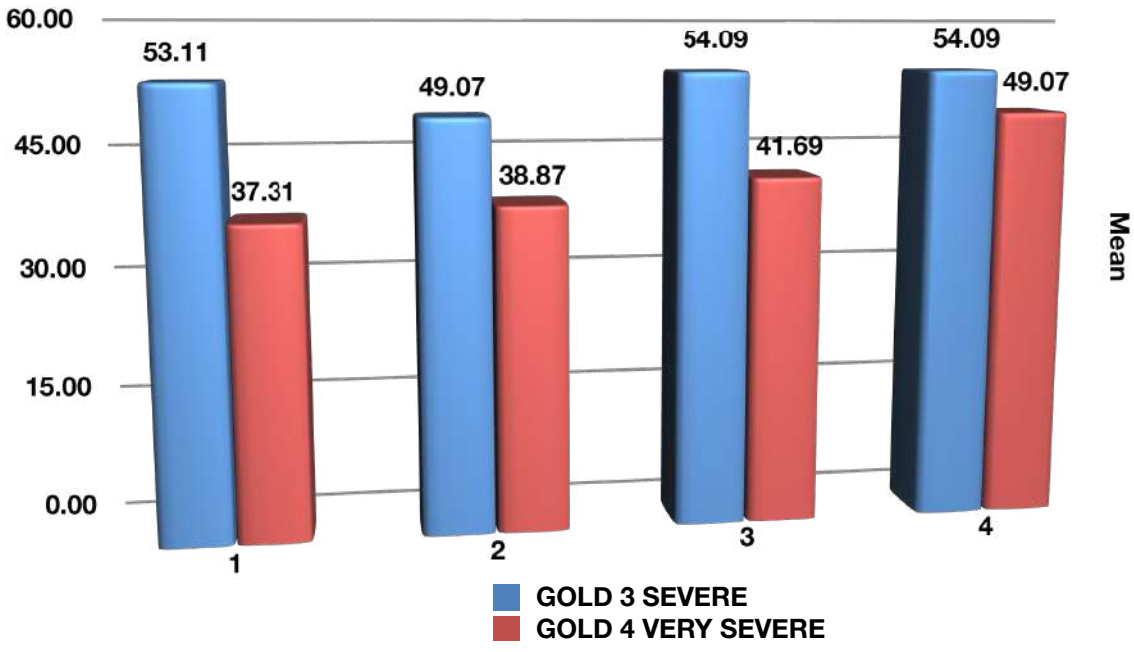


Table 12- CORRELATION OF QOL OF PATIENTS WITH AGE

			N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum	F	p-value
	Age (YEARS)					Lower Bound	Upper Bound				
1	Domain 1 transformed score (0-100)	36-45	15	48.87	12.311	42.05	55.68	25	63	3.615	**0.031***
		46-55	24	50.96	14.287	44.93	56.99	31	69		
		56-70	61	43.34	11.920	40.29	46.40	19	69		
		Total	100	46.00	12.904	43.44	48.56	19	69		
2	Domain 2 transformed score (0-100)	36-45	15	46.87	12.733	39.82	53.92	25	69	1.081	0.343
		46-55	24	46.33	12.060	41.24	51.43	31	69		
		56-70	61	43.16	10.533	40.47	45.86	25	69		
		Total	100	44.48	11.257	42.25	46.71	25	69		
3	Domain 3 transformed score (0-100)	36-45	15	57.53	14.242	49.65	65.42	25	75	7.381	**0.001***
		46-55	24	52.92	13.887	47.05	58.78	25	75		
		56-70	61	44.56	12.958	41.24	47.88	25	75		
		Total	100	48.51	14.210	45.69	51.33	25	75		
4	Domain 4 transformed score (0-100)	36-45	15	54.73	7.372	50.65	58.82	44	63	4.842	**0.01***
		46-55	24	56.00	12.004	50.93	61.07	25	69		
		56-70	61	49.48	8.906	47.19	51.76	31	69		
		Total	100	51.83	9.907	49.86	53.80	25	69		

Table shows QOL on physical, social and environmental domain of BREF was significantly related to age of the patient i.e. with advancing age, QOL of COPD patient declines.

FIGURE 12- CORRELATION OF QOL WITH GENDER OF COPD PATIENTS

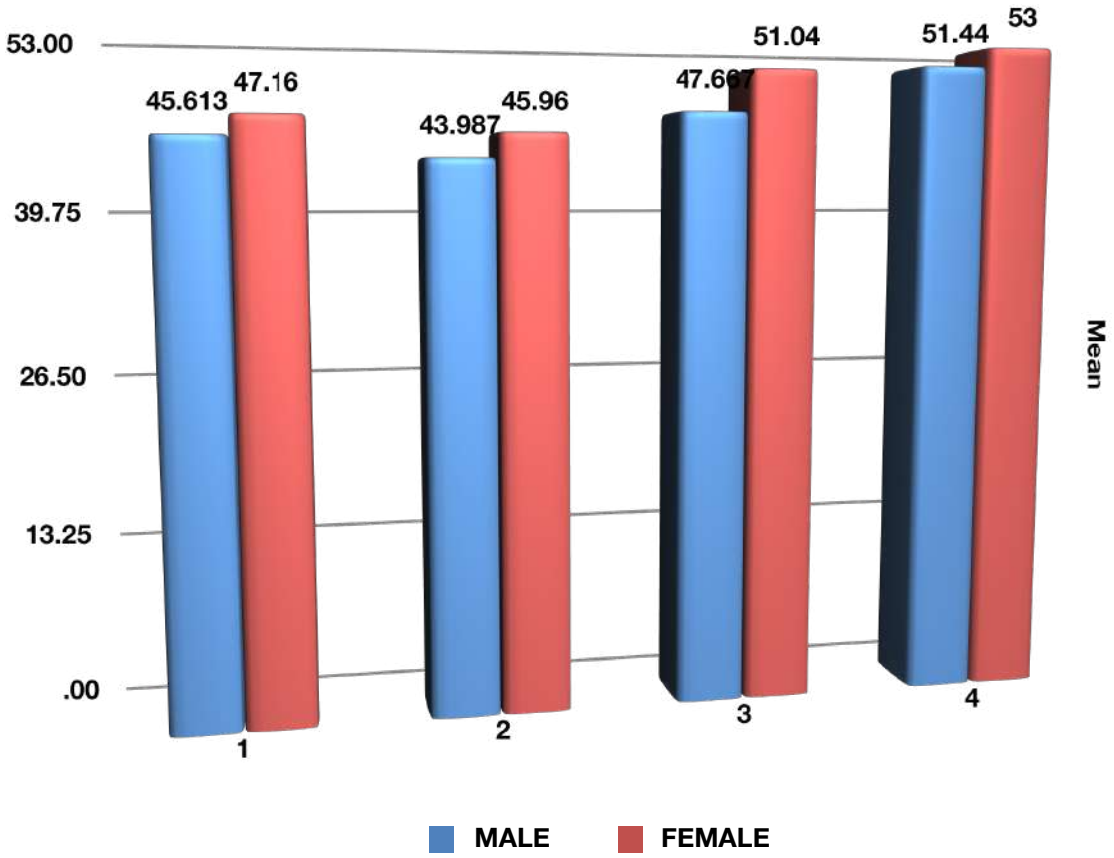


Figure shows that female patients had relatively better quality of life on all domains than the male patients

Table 13- CORRELATION OF QOL OF COPD PATIENTS WITH OCCUPATION

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	F	p-value
	Occupation					Lower Bound	Upper Bound				
Domain 1 transformed score (0-100)	PROFESSIONAL	12	46.00	12.060	3.482	38.34	53.66	31	69	0.230	0.948
	SELF EMPLOYED	23	46.43	14.927	3.112	39.98	52.89	19	69		
	SKILLED	13	47.23	16.868	4.678	37.04	57.42	25	69		
	SEMI SKILLED	12	43.50	9.681	2.795	37.35	49.65	31	63		
	UNSKILLED	2	53.00	4.243	3.000	14.88	91.12	50	56		
	UNEMPLOYED /RETIRED	38	45.74	11.993	1.945	41.79	49.68	25	69		
	Total	100	46.00	12.904	1.290	43.44	48.56	19	69		
Domain 2 transformed score (0-100)	PROFESSIONAL	12	43.92	13.392	3.866	35.41	52.43	25	69	0.536	0.748
	SELF EMPLOYED	23	44.39	13.567	2.829	38.52	50.26	25	69		
	SKILLED	13	44.85	11.775	3.266	37.73	51.96	25	63		
	SEMI SKILLED	12	42.00	9.352	2.700	36.06	47.94	31	69		
	UNSKILLED	2	56.00	.000	.000	56.00	56.00	56	56		
	UNEMPLOYED /RETIRED	38	44.76	9.794	1.589	41.54	47.98	25	63		
	Total	100	44.48	11.257	1.126	42.25	46.71	25	69		
Domain 3 transformed score (0-100)	PROFESSIONAL	12	50.08	11.642	3.361	42.69	57.48	25	69	0.326	0.896
	SELF EMPLOYED	23	45.30	16.041	3.345	38.37	52.24	25	75		
	SKILLED	13	48.54	12.245	3.396	41.14	55.94	25	75		
	SEMI SKILLED	12	50.58	14.055	4.057	41.65	59.51	31	75		
	UNSKILLED	2	50.00	.000	.000	50.00	50.00	50	50		
	UNEMPLOYED /RETIRED	38	49.21	15.180	2.463	44.22	54.20	25	75		
	Total	100	48.51	14.210	1.421	45.69	51.33	25	75		
Domain 4 transformed score (0-100)	PROFESSIONAL	12	54.92	10.086	2.911	48.51	61.32	44	69	1.112	0.359
	SELF EMPLOYED	23	52.96	10.311	2.150	48.50	57.42	38	69		
	SKILLED	13	49.54	7.479	2.074	45.02	54.06	31	63		
	SEMI SKILLED	12	49.17	12.734	3.676	41.08	57.26	25	69		
	UNSKILLED	2	41.00	4.243	3.000	2.88	79.12	38	44		
	UNEMPLOYED /RETIRED	38	52.37	9.362	1.519	49.29	55.45	38	69		
	Total	100	51.83	9.907	.991	49.86	53.80	25	69		

Table shows QOL of COPD patients was unrelated to type of occupation of the patient.

FIGURE 13- CORRELATION OF QOL OF COPD PATIENTS WITH RESPECT TO MARITAL STATUS

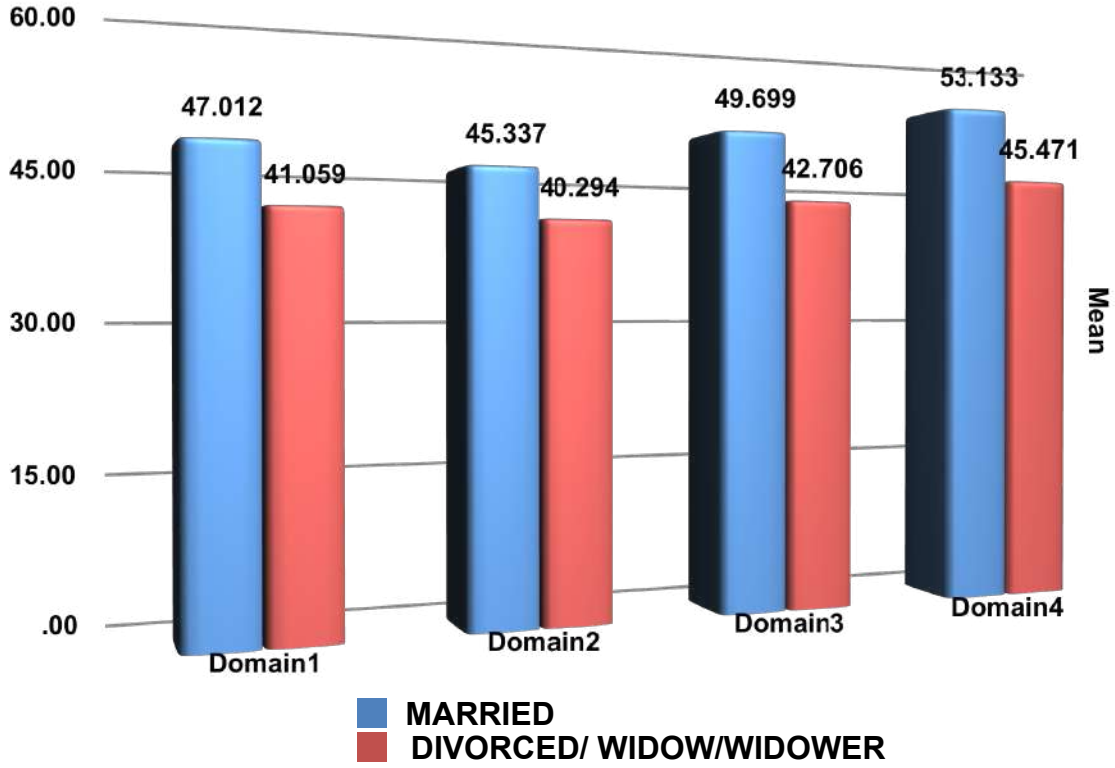
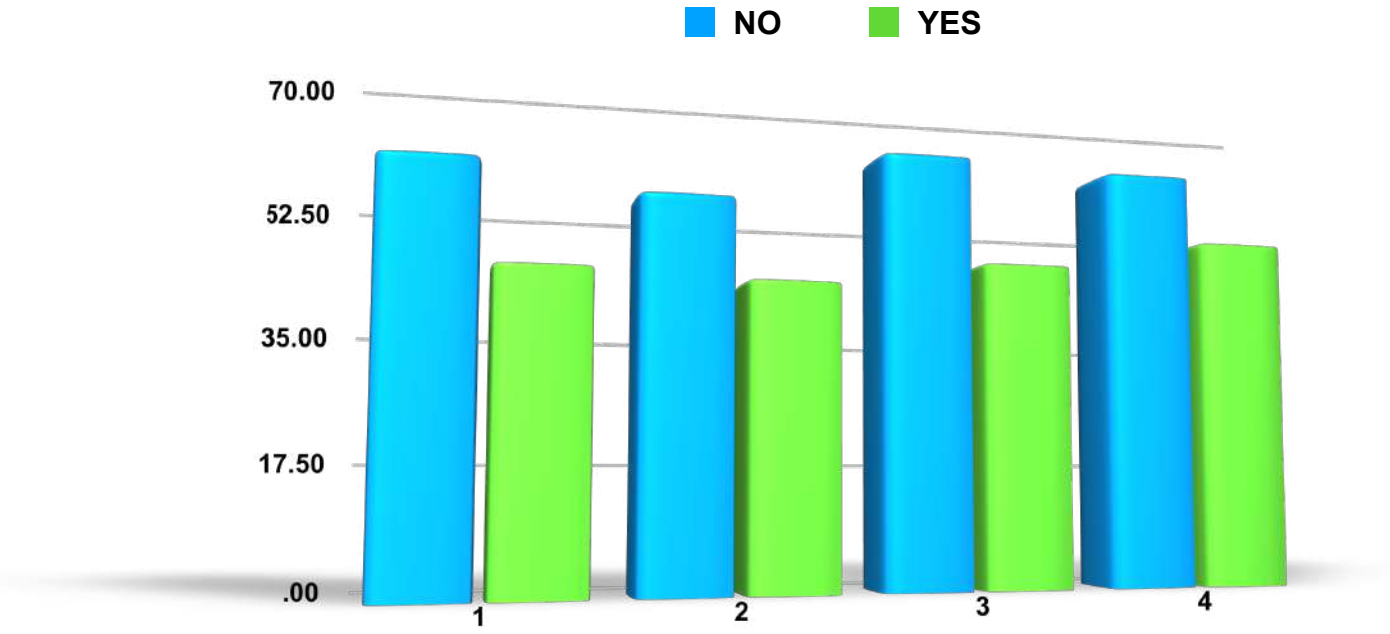


Figure shows QOL of married patients was better than the ones who were not.

Table 14- CORRELATION OF QOL OF COPD PATIENTS WITH PRESENCE OF PSYCHIATRIC COMORBIDITY

	WHO QOL BREF DOMAINS	Psychiatric CoMorbidity	N	Mean	Std. Deviation	t	p-value
1	Domain 1 transformed score (0-100)	NO	17	57.53	9.501	4.403*	**0.011**
		YES	83	43.64	12.257		
2	Domain 2 transformed score (0-100)	NO	17	53.82	9.863	4.036*	**0.015**
		YES	83	42.57	10.592		
3	Domain 3 transformed score (0-100)	NO	17	61.00	13.058	4.318*	**0.001**
		YES	83	45.95	13.098		
4	Domain 4 transformed score (0-100)	NO	17	59.82	12.228	3.906*	**0.022**
		YES	83	50.19	8.565		

FIGURE 14 - CORRELATION OF QOL OF COPD PATIENTS WITH PRESENCE OF PSYCHIATRIC COMORBIDITY



QOL in all domains is worse in presence of psychiatric co-morbidities in COPD patients as shown in the figure.

Table 15- CO-RELATION OF QOL OF COPD PATIENTS WITH PRESENCE OF PSYCHIATRIC COMORBIDITY

	major depressive disorder/ recurrent depressive disorder	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	**NO**	**69**	**49.10**	**12.738**	**3.824**	**0.001***
	YES	**31**	**39.10**	**10.505**		
Domain 2 transformed score (0-100)	**NO**	**69**	**46.81**	**11.756**	**3.234**	**0.002***
	YES	**31**	**39.29**	**8.034**		
Domain 3 transformed score (0-100)	**NO**	**69**	**51.38**	**14.579**	**3.142**	**0.002***
	YES	**31**	**42.13**	**11.117**		
Domain 4 transformed score (0-100)	NO	69	52.38	10.632	0.822	0.413
	YES	31	50.61	8.090		
	substance abuse / dependence (non alcohol)	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	NO	59	48.03	13.152	1.916	0.058
	YES	41	43.07	12.102		
Domain 2 transformed score (0-100)	NO	59	45.07	10.885	0.624	0.534
	YES	41	43.63	11.857		
Domain 3 transformed score (0-100)	NO	59	50.34	14.666	1.555	0.123
	YES	41	45.88	13.261		
Domain 4 transformed score (0-100)	NO	59	53.31	10.698	1.8036	0.074
	YES	41	49.71	8.313		
	alcohol abuse/ dependence	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	NO	84	45.73	13.144	-0.484	0.629
	YES	16	47.44	11.854		
Domain 2 transformed score (0-100)	NO	84	44.23	11.206	-0.515	0.608
	YES	16	45.81	11.800		
Domain 3 transformed score (0-100)	NO	84	48.98	14.199	0.75	0.455
	YES	16	46.06	14.475		
Domain 4 transformed score (0-100)	NO	84	52.52	9.964	0.417	0.109
	YES	16	48.19	9.028		

Table shows significant association on domains of QOL with presence of MDD/RDD in patients, not in substance / alcohol abuse/ dependence.

FIGURE 15- DISTRIBUTION OF CAREGIVER WITH RESPECT TO AGE

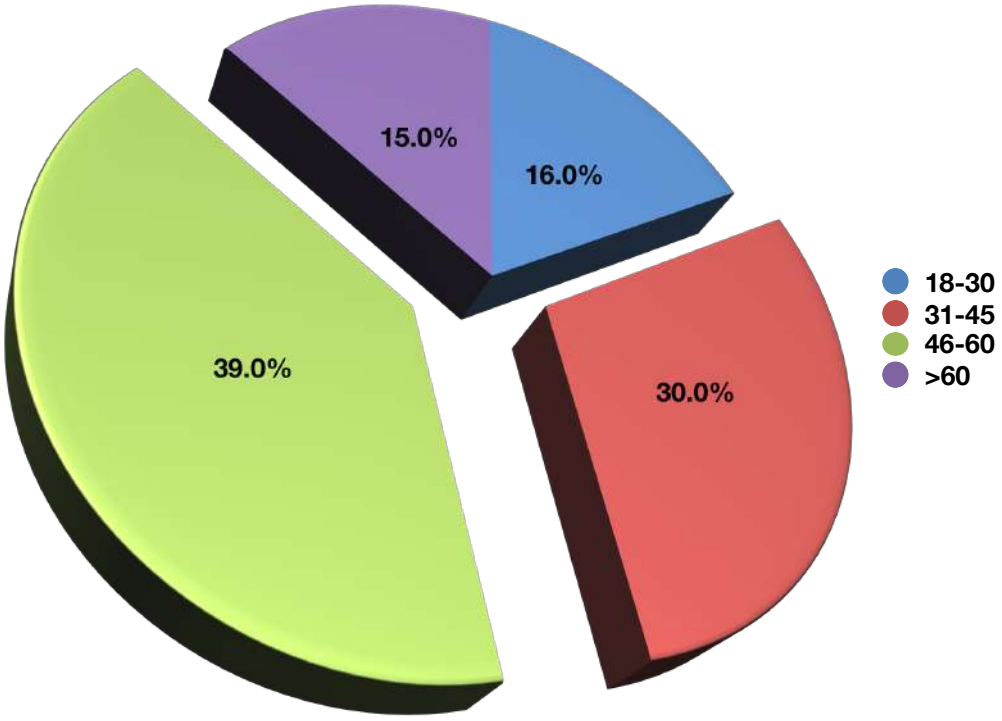


Figure shows majority caregivers in age range of 46-60 years followed by 31-45 years.

FIGURE 16 - DISTRIBUTION OF CAREGIVER WITH RESPECT TO GENDER

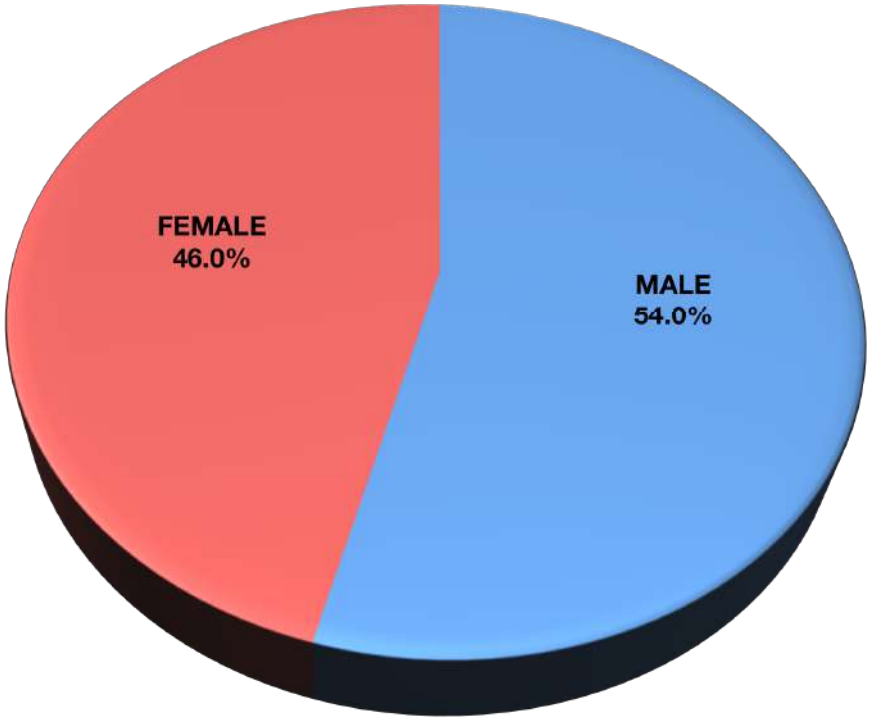


Figure shows majority caregivers are males.

Table 16- DISTRIBUTION OF CAREGIVER WITH RESPECT TO RELATIONSHIP WITH THE PATIENT

	Relationship	No. of caregiver	Percentage
1	FATHER	5	5.0%
2	MOTHER	4	4.0%
3	**SPOUSE**	**42**	**42.0%**
4	**SON/ DAUGHTER**	**33**	**33.0%**
5	SON/DAUGHTER IN LAW	13	13.0%
6	SIBLING	3	3.0%

Table shows majority of the caregivers were related to patients as either spouse or children.

FIGURE 17- DISTRIBUTION OF CAREGIVER WITH RESPECT TO RELATIONSHIP WITH THE PATIENT

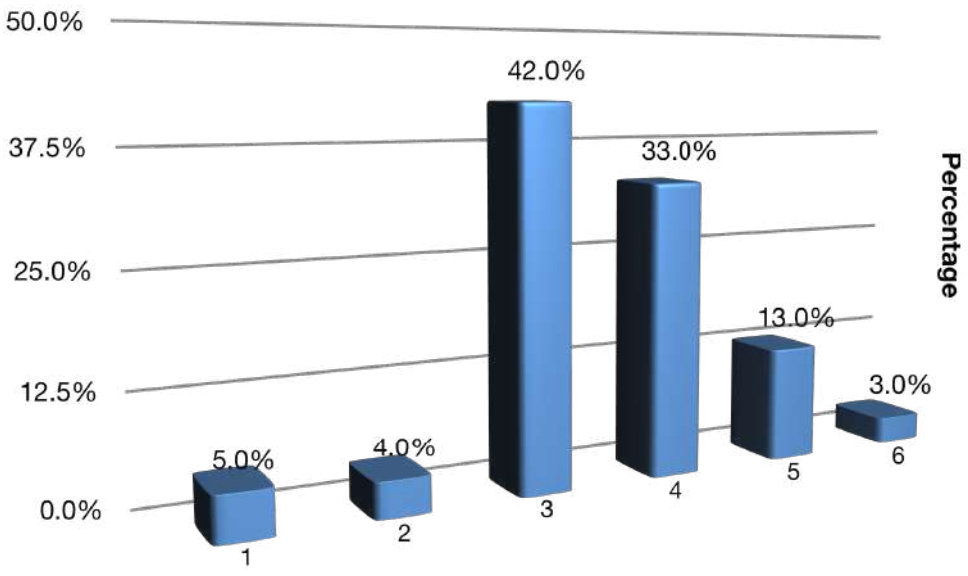
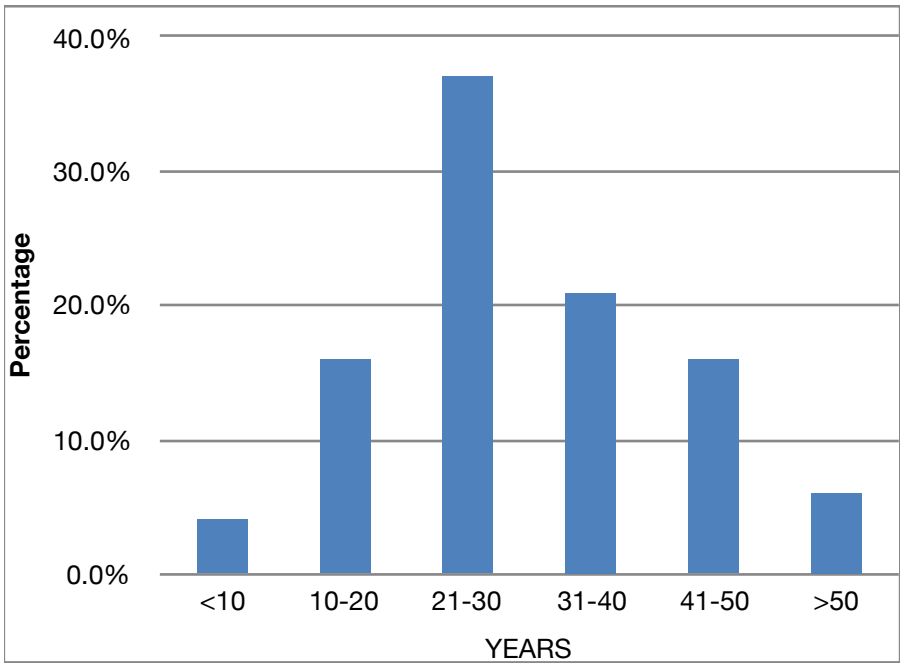


Table 17- DISTRIBUTION OF CAREGIVER WITH RESPECT TO DURATION OF LIVING TOGETHER

Duration of living together (YEARS)	No. of caregiver	Percentage
<10	4	4.0%
10-20	16	16.0%
21-30	**37**	**37.0%**
31-40	21	21.0%
41-50	16	16.0%
>50	6	6.0%

FIGURE 18 - DISTRIBUTION OF CAREGIVER WITH RESPECT TO DURATION OF LIVING TOGETHER



Most of the caregivers were living with the patient for 21-30 years as most of the caregivers were either related as spouse or as child of the patient.

Table 18- DISTRIBUTION OF CAREGIVER WITH RESPECT TO SEVERITY OF COPD IN PATIENT

Grade/ Severity	No. of caregiver	Percentage
GOLD 3 SEVERE COPD	56	56.0%
GOLD 4 VERY SEVERE COPD	44	44.0%

Table shows caregivers of grade 3 COPD are more than grade 4 in concordance to the patients.

FIGURE 19- DISTRIBUTION OF CAREGIVER WITH RESPECT TO SEVERITY OF COPD IN PATIENT

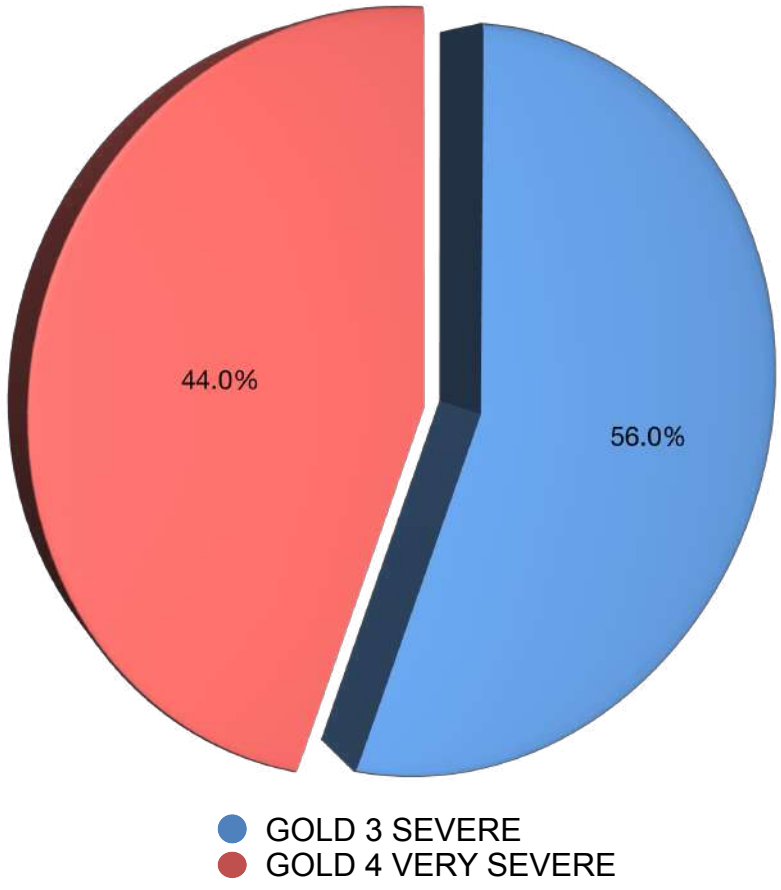


TABLE 19- DISTRIBUTION OF CAREGIVERS WITH RESPECT TO PSYCHIATRIC MORBIDITY ON M.I.N.I.

MINI	No. of caregiver	Percentage
major depressive disorder/ recurrent depressive disorder	**10**	**10.0%**
dysthymia	**10**	**10.0%**
sucidality	0	0.0%
manic episode	0	0.0%
panic attack/ DISORDER	4	4.0%
agoraphobia	1	1.0%
social phobia	4	4.0%
obsessive compulsive disorder	0	0.0%
post traumatic stress disorder	0	0.0%
alcohol abuse/dependence	**23**	**23.0%**
substance abuse/dependence (non alcohol)	13	13.0%
psychotic disorder	0	0.0%
Anorexia nervosa	0	0.0%
Bulimia nervosa	0	0.0%
generalised anxiety disorder	**10**	**10.0%**
antisocial personality	0	0.0%

Table shows 59% COPD caregivers had psychiatric morbidities out of which alcohol abuse/dependence was most common and frequent followed by dysthymia, MDD/RDD and GAD.

TABLE 20- CORRELATION OF PSYCHIATRIC MORBIDITY IN CAREGIVER WITH GRADE OF COPD IN PATIENT

		Grade/ Severity				Total	Chi-square value	p-value
		GOLD 3 SEVERE		GOLD 4 VERY SEVERE				
MINI_major depressive disorder/ recurrent depressive disorder	NO	52	92.9%	38	86.4%	90	1.154	0.328
	YES	4	7.1%	6	13.6%	10		
dysthymia	NO	52	92.9%	38	86.4%	90	1.154	0.328
	YES	4	7.1%	6	13.6%	10		
sucidality	NO	56	100.0%	44	100.0%	100		
manic episode	NO	56	100.0%	44	100.0%	100		
panic attack/ DISORDER	NO	55	98.2%	41	93.2%	96	1.625	0.317
	YES	1	1.8%	3	6.8%	4		
agoraphobia	NO	56	100.0%	43	97.7%	99	1.286	0.257
	YES	0	0.0%	1	2.3%	1		
social phobia	NO	52	92.9%	44	100.0%	96	3.274	0.128
	YES	4	7.1%	0	0.0%	4		
obsessive compulsive disorder	NO	56	100.0%	44	100.0%	100		
post traumatic stress disorder	NO	56	100.0%	44	100.0%	100		
alcohol abuse/ dependence	NO	41	73.2%	36	81.8%	77	1.03	0.347
	YES	15	26.8%	8	18.2%	23		
substance abuse/ dependence (non alcohol)	NO	48	85.7%	39	88.6%	87	0.186	0.666
	YES	8	14.3%	5	11.4%	13		
psychotic disorder	NO	56	100.0%	44	100.0%	100		
Anorexia nervosa	NO	56	100.0%	44	100.0%	100		
Bulimia nervosa	NO	56	100.0%	44	100.0%	100		
generalised anxiety disorder	NO	53	94.6%	37	84.1%	90	3.048	0.081
	YES	3	5.4%	7	15.9%	10		
antisocial personality	NO	56	100.0%	44	100.0%	100		

Table shows non significant association between psychiatric morbidity in caregiver and the grade of COPD.

TABLE 21- MEAN WHO QOL BREF SCORES OF CAREGIVERS OF COPD PATIENTS

	N	Minimum	Maximum	Mean	SD
PHYSICAL DOMAIN	100	31	81	61.09	11.83
PSYCHOLOGICAL DOMAIN	100	31	81	58.49	10.02
SOCIAL DOMAIN	100	31	75	66.39	10.22
ENVIRONMENTAL DOMAIN	100	38	75	60.19	8.51

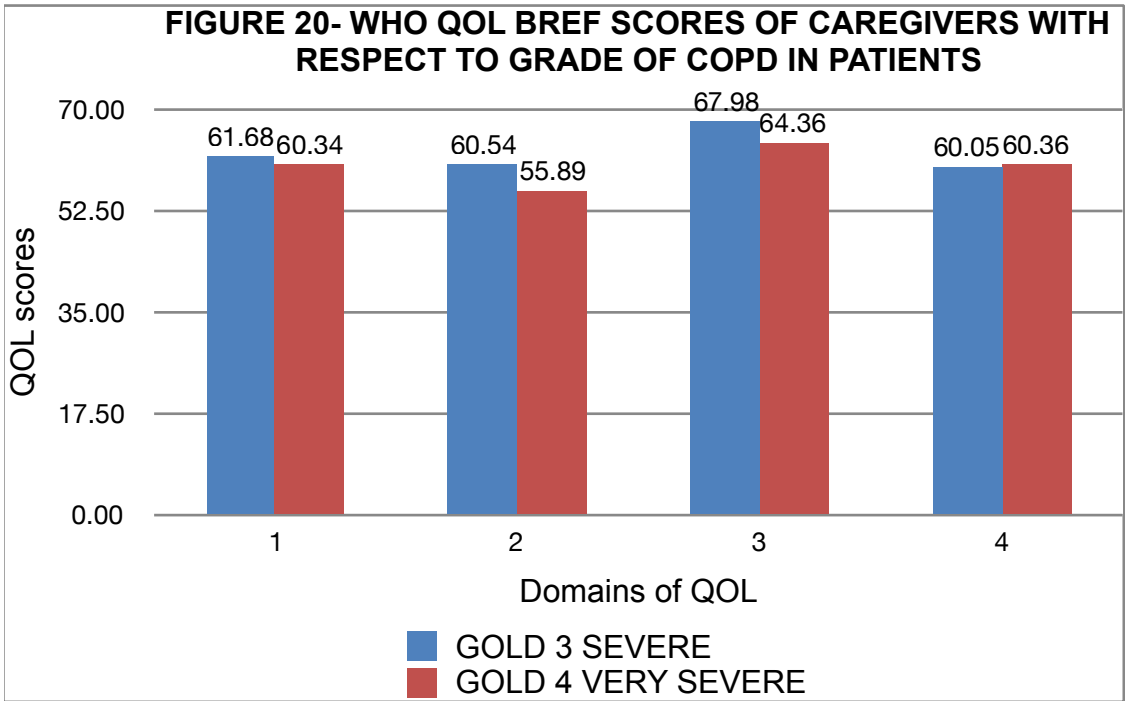
Table shows mean scores of domains of QOL of caregivers of COPD patients.

Table 22- WHO QOL BREF SCORES OF CAREGIVERS WITH RESPECT TO GRADE OF COPD IN PATIENTS

	Grade/ Severity	GOLD 3 SEVERE		GOLD 4 VERY SEVERE		t	p-value	Difference		95% Confidence Interval of the Difference	
		MEAN	SD	MEAN	SD			Mean	Std. Error	Lower	Upper
1	PHYSICAL DOMAIN	61.68	11.71	60.34	12.07	0.559	0.577	1.34	2.39	-3.41	6.08
2	**PSYCHOLOGICAL DOMAIN**	**60.54**	**9.15**	**55.89**	**10.56**	**2.356**	**0.020**	4.65	1.97	0.73	8.56
3	SOCIAL DOMAIN	67.98	9.48	64.36	10.87	1.776	0.079	3.62	2.04	-0.42	7.66
4	ENVIRONMENTAL DOMAIN	60.05	8.65	60.36	8.41	-0.180	0.858	-0.31	1.72	-3.73	3.11

Table shows QOL of caregiver was significantly related to grade of COPD on psychological domain only. With increasing severity of COPD, psychological QOL of caregiver significantly decreases.

FIGURE 20- WHO QOL BREF SCORES OF CAREGIVERS WITH RESPECT TO GRADE OF COPD IN PATIENTS



QOL of the caregiver deteriorates with the increasing severity of COPD in the patients.

Table 23- WHO QOL BREF SCORES OF CAREGIVERS WITH RESPECT TO AGE OF CAREGIVER

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	F	p-value
	Age					Lower Bound	Upper Bound				
Domain 1 transformed score (0-100)	18-30	16	64.81	8.612	2.153	60.22	69.40	38	81	7.805	**0.011***
	31-45	30	64.60	9.482	1.731	61.06	68.14	31	81		
	46-60	39	61.44	11.045	1.769	57.86	65.02	31	75		
	>60	15	49.20	14.098	3.640	41.39	57.01	31	69		
	Total	100	61.09	11.830	1.183	58.74	63.44	31	81		
Domain 2 transformed score (0-100)	18-30	16	63.75	8.087	2.022	59.44	68.06	50	81	7.278	**0.02***
	31-45	30	61.67	7.457	1.361	58.88	64.45	44	75		
	46-60	39	57.05	9.730	1.558	53.90	60.21	38	75		
	>60	15	50.27	11.653	3.009	43.81	56.72	31	69		
	Total	100	58.49	10.017	1.002	56.50	60.48	31	81		
Domain 3 transformed score (0-100)	18-30	16	68.75	8.911	2.228	64.00	73.50	50	75	4.563	**0.005***
	31-45	30	70.23	7.519	1.373	67.43	73.04	50	75		
	46-60	39	65.08	9.672	1.549	61.94	68.21	50	75		
	>60	15	59.60	13.809	3.565	51.95	67.25	31	75		
	Total	100	66.39	10.223	1.022	64.36	68.42	31	75		
Domain 4 transformed score (0-100)	18-30	16	61.63	9.201	2.300	56.72	66.53	38	69	5.946	**0.001***
	31-45	30	63.83	5.052	.922	61.95	65.72	50	69		
	46-60	39	59.36	9.118	1.460	56.40	62.31	44	75		
	>60	15	53.53	7.900	2.040	49.16	57.91	44	63		
	Total	100	60.19	8.508	.851	58.50	61.88	38	75		

Table shows with advancing age of the caregiver, QOL significantly decreases on all domains.

Table 24- CORRELATION OF QOL OF CAREGIVER WITH RELATIONSHIP TO PATIENT

	RELATIONSHIP		N	Mean	SD	SE	95% Confidence Interval for Mean		Minimum	Maximum	F	p-value
							Lower Bound	Upper Bound				
1	Domain 1 transformed score (0-100)	FATHER	5	40.00	14.036	6.277	22.57	57.43	31	63	4.795	**0.001***
		MOTHER	4	57.75	3.500	1.750	52.18	63.32	56	63		
		SPOUSE	42	60.62	12.500	1.929	56.72	64.51	31	75		
		CHILD	33	63.15	10.112	1.760	59.57	66.74	31	81		
		SON/ DAUGHTER IN LAW	13	66.62	5.378	1.492	63.37	69.87	56	75		
		SIBLING	3	60.67	9.713	5.608	36.54	84.79	50	69		
		Total	100	61.09	11.830	1.183	58.74	63.44	31	81		
2	Domain 2 transformed score (0-100)	FATHER	5	51.60	10.407	4.654	38.68	64.52	44	63	3.909	**0.003***
		MOTHER	4	46.75	11.927	5.963	27.77	65.73	31	56		
		SPOUSE	42	57.33	10.566	1.630	54.04	60.63	38	75		
		CHILD	33	60.73	8.285	1.442	57.79	63.67	44	81		
		SON/ DAUGHTER IN LAW	13	64.69	5.391	1.495	61.43	67.95	56	75		
		SIBLING	3	50.33	10.970	6.333	23.08	77.58	44	63		
		Total	100	58.49	10.017	1.002	56.50	60.48	31	81		
3	Domain 3 transformed score (0-100)	FATHER	5	62.60	17.855	7.985	40.43	84.77	31	75	1.704	0.141
		MOTHER	4	59.50	12.014	6.007	40.38	78.62	44	69		
		SPOUSE	42	64.88	10.739	1.657	61.53	68.23	50	75		
		CHILD	33	69.73	7.090	1.234	67.21	72.24	56	75		
		SON/ DAUGHTER IN LAW	13	67.77	10.521	2.918	61.41	74.13	50	75		
		SIBLING	3	60.33	7.506	4.333	41.69	78.98	56	69		
		Total	100	66.39	10.223	1.022	64.36	68.42	31	75		
4	Domain 4 transformed score (0-100)	FATHER	5	51.60	10.407	4.654	38.68	64.52	44	63	3.284	**0.009***
		MOTHER	4	51.50	5.745	2.872	42.36	60.64	44	56		
		SPOUSE	42	60.81	8.422	1.300	58.18	63.43	44	75		
		CHILD	33	60.06	8.492	1.478	57.05	63.07	38	69		
		SON/ DAUGHTER IN LAW	13	65.31	3.038	.843	63.47	67.14	63	69		
		SIBLING	3	56.67	10.970	6.333	29.42	83.92	44	63		
		Total	100	60.19	8.508	.851	58.50	61.88	38	75		

Table shows significant correlation of QOL of caregiver with relationship to patient on physical, psychological and environmental domain.

FIGURE 21 - CORRELATION OF QOL OF CAREGIVER WITH RELATIONSHIP TO PATIENT

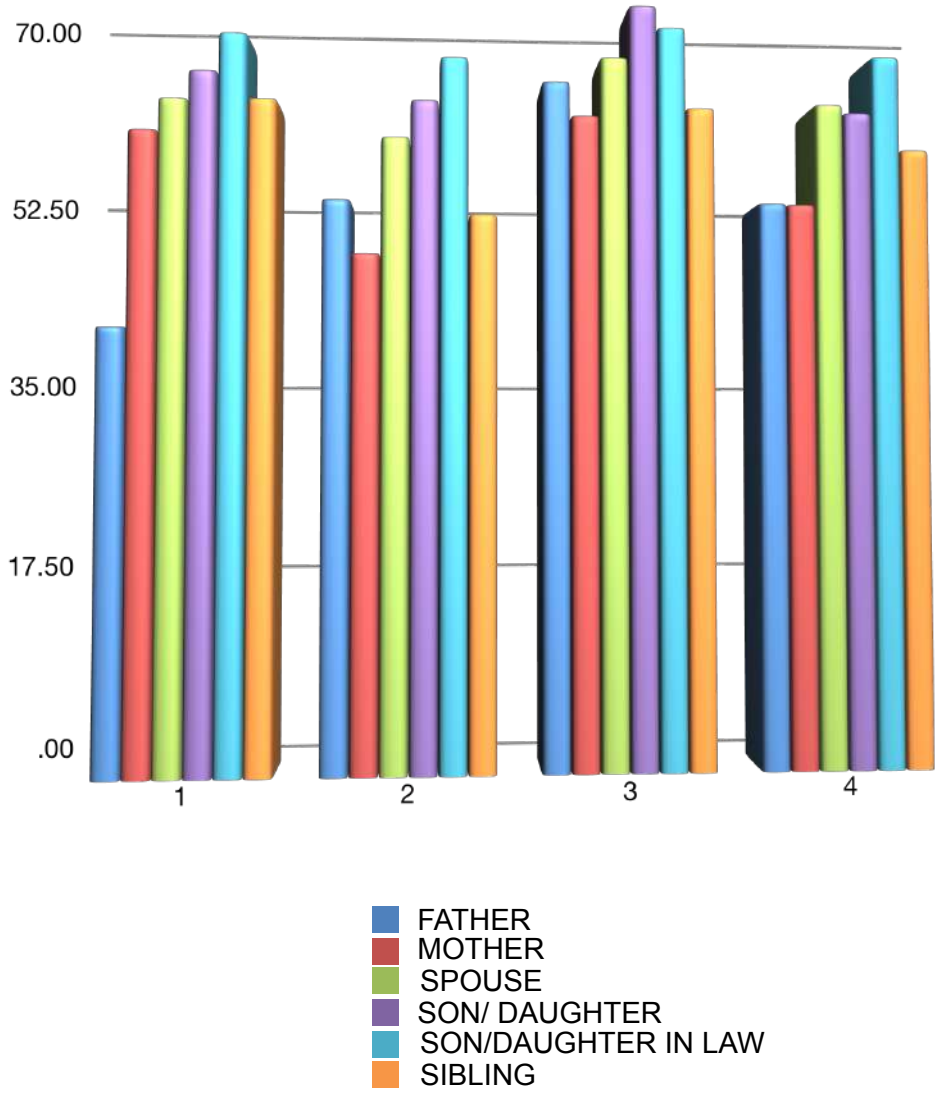


Table 25- CORRELATION OF QOL OF CAREGIVER WITH PRESENCE OF PSYCHIATRIC MORBIDITY

		Psychatric Morbidity	N	Mean	Std. Deviation	t	p-value
1	Domain 1 transformed score (0-100)	NO	41	62.85	12.943	1.246	0.216
		YES	59	59.86	10.936		
2	**Domain 2 transformed score (0-100)**	**NO**	**41**	**62.54**	**8.597**	**3.561**	**0.001***
		YES	**59**	**55.68**	**10.033**		
3	**Domain 3 transformed score (0-100)**	**NO**	**41**	**70.00**	**8.090**	**3.066**	**0.003***
		YES	**59**	**63.88**	**10.845**		
4	Domain 4 transformed score (0-100)	NO	41	61.41	9.236	1.203	0.232
		YES	59	59.34	7.932		

Table shows QOL of the caregiver on psychological and social domain was significantly associated with psychiatric morbidity. It declines in presence of psychiatric morbidities in the caregiver.

FIGURE 22 - CORRELATION OF QOL OF CAREGIVER WITH PRESENCE OF PSYCHIATRIC MORBIDITY

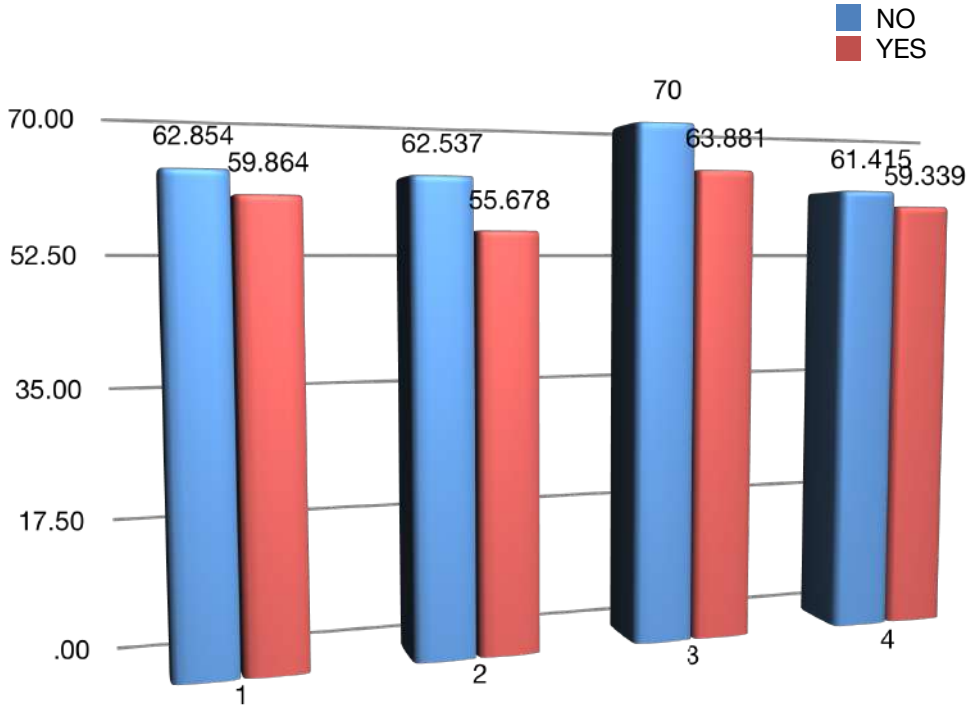


Table 26- CORRELATION OF QOL OF CAREGIVER WITH PRESENCE OF DEPRESSION

	MINI_major depressive disorder/ recurrent depressive disorder	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	NO	90	61.80	11.829	1.822	0.072
	YES	10	54.70	10.264		
Domain 2 transformed score (0-100)	NO	90	59.56	9.670	3.352	**0.001***
	YES	10	48.90	8.089		
Domain 3 transformed score (0-100)	NO	90	67.31	9.934	2.795	**0.006***
	YES	10	58.10	9.422		
Domain 4 transformed score (0-100)	NO	90	60.83	8.525	2.318	**0.023***
	YES	10	54.40	6.004		

Table shows QOL of caregiver significantly decreases with presence of depression.

Table 27- CORRELATION OF QOL OF CAREGIVER WITH PRESENCE OF ALCOHOL ABUSE / DEPENDENCE

	alcohol abuse/ dependence	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	NO	77	61.71	11.724	0.965	0.337
	YES	23	59.00	12.207		
Domain 2 transformed score (0-100)	NO	77	58.56	10.351	0.124	0.901
	YES	23	58.26	9.016		
Domain 3 transformed score (0-100)	NO	77	67.39	9.488	1.81	0.073
	YES	23	63.04	12.002		
Domain 4 transformed score (0-100)	NO	77	60.17	8.630	-0.045	0.964
	YES	23	60.26	8.269		

Table shows non significant correlation of QOL of caregiver with presence of alcohol abuse / dependence.

Table 28- CORRELATION OF QOL OF CAREGIVER WITH PRESENCE OF SUBSTANCE ABUSE / DEPENDENCE (NON ALCOHOL)

	substance abuse/ dependence (non alcohol)	N	Mean	Std. Deviation	t	p-value
Domain 1 transformed score (0-100)	NO	87	60.85	12.446	-0.522	0.603
	YES	13	62.69	6.421		
Domain 2 transformed score (0-100)	NO	87	58.94	9.976	1.171	0.244
	YES	13	55.46	10.154		
Domain 3 transformed score (0-100)	NO	87	66.46	10.378	0.176	0.861
	YES	13	65.92	9.491		
Domain 4 transformed score (0-100)	NO	87	59.89	8.794	-0.927	0.356
	YES	13	62.23	6.139		

Table shows non significant correlation of QOL of caregiver with presence of substance abuse / dependence (non alcohol).

TABLE 29- COMPARISON OF QOL BETWEEN PATIENT AND CAREGIVER IN SEVERE COPD

	Grade/ Severity-I	Patient		Caregiver		t	p-value	Difference	
		MEAN	SD	MEAN	SD			Mean	Std. Error
1	PHYSICAL DOMAIN	53.11	10.92	62.24	11.05	-6.277	**0.002***	-9.13	10.78
2	PSYCHOLOGICAL DOMAIN	49.07	11.77	60.84	8.95	-7.070	**0.003***	-11.76	12.34
3	SOCIAL RELATIONSHIP DOMAIN	54.09	14.79	67.96	9.56	-6.974	**0.01***	-13.87	14.75
4	ENVIRONMENTAL DOMAIN	54.09	11.06	60.35	8.45	-4.935	**0.03***	-6.25	9.40

Table shows QOL of the patient was significantly worse than his caregiver on all domains of BREF in grade 3 COPD.

FIGURE 23 - COMPARISON OF QOL BETWEEN PATIENT AND CAREGIVER IN SEVERE COPD

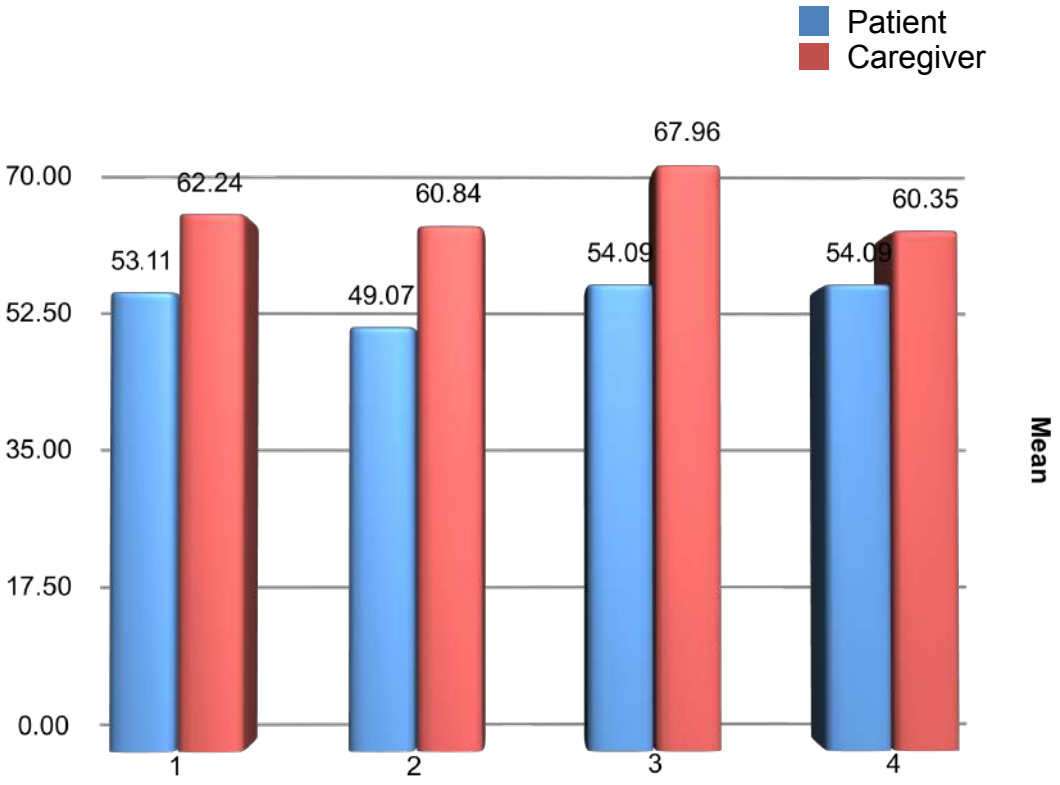
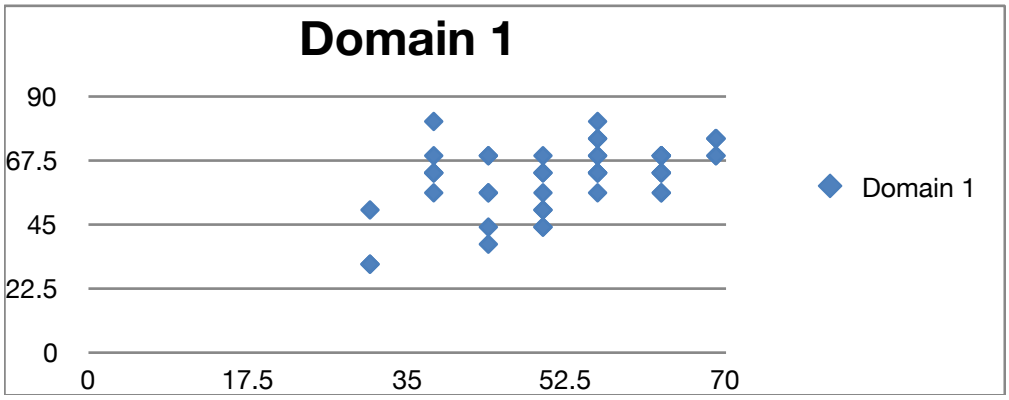
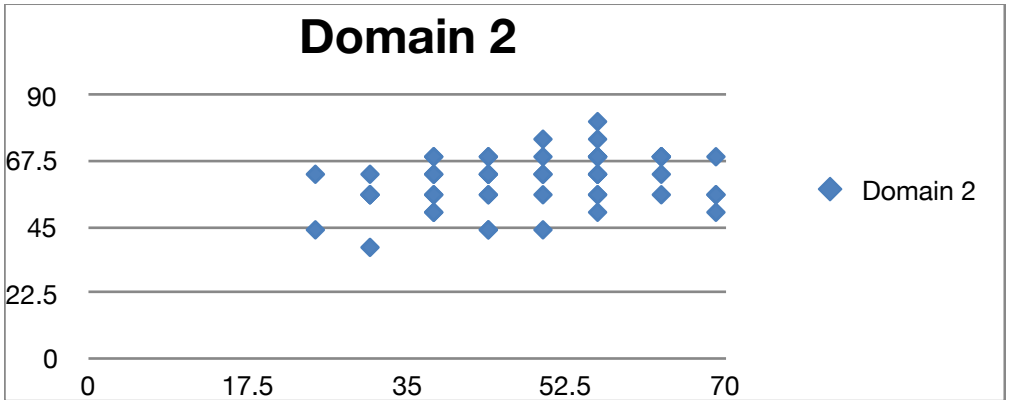
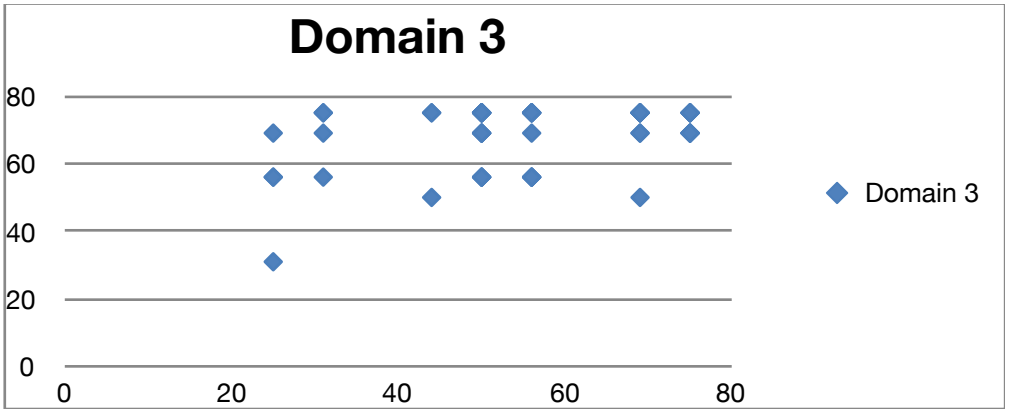


FIGURE 24- SCATTER PLOT SHOWING CORRELATION OF QOL BETWEEN PATIENT AND CAREGIVER IN SEVERE COPD







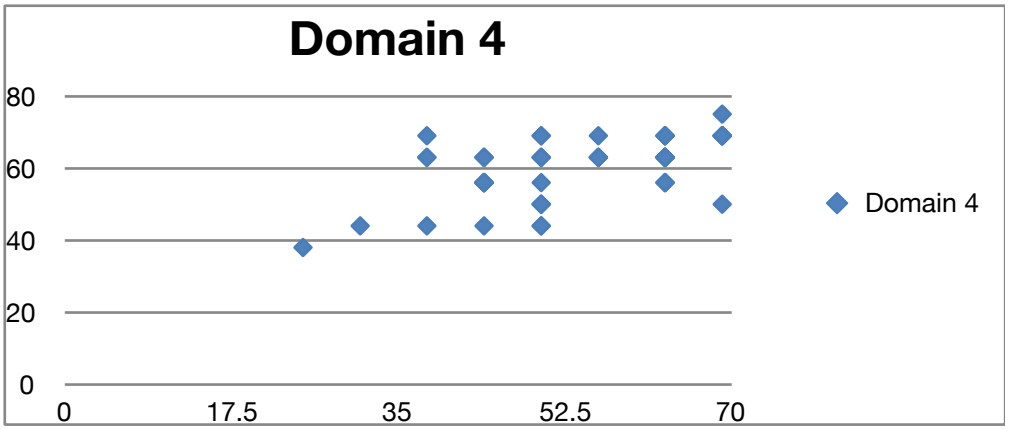


Table 30- CORRELATION OF QOL DOMAINS WITH GOLD 3 COPD

GOLD 3 COPD	N	Correlation	p-value
PHYSICAL DOMAIN 1	55	0.518	**0.003***
PSYCHOLOGICAL DOMAIN 2	55	0.315	**0.019***
SOCIAL DOMAIN 3	55	0.327	**0.014***
ENVIRONMENTAL DOMAIN 4	55	0.564	**0.007***

Table shows QOL and grade 3 COPD had significant positive correlation.

TABLE 31- COMPARISON OF QOL BETWEEN PATIENT AND CAREGIVER IN VERY SEVERE COPD

	Grade/ Severity-2	Patient		Caregiver		t	p-value	Difference	
		Mean	SD	Mean	SD			Mean	Std. Error
1	PHYSICAL DOMAIN	37.31	9.38	59.69	12.71	-13.698	**0.002***	-22.38	10.96
2	PSYCHOLOGICAL DOMAIN	38.87	7.52	55.62	10.59	-10.940	**0.027***	-16.76	10.27
3	SOCIAL RELATIONSHIP DOMAIN	41.69	9.97	64.47	10.77	-11.113	**0.009***	-22.78	13.75
4	ENVIRONMENTAL DOMAIN	49.07	7.52	60.00	8.67	-9.186	**0.006***	-10.93	7.98

Table shows QOL of the patient was significantly worse than his caregiver on all domains of BREF in grade 4 COPD.

FIGURE 25 - COMPARISON OF QOL BETWEEN PATIENT AND CAREGIVER IN VERY SEVERE COPD

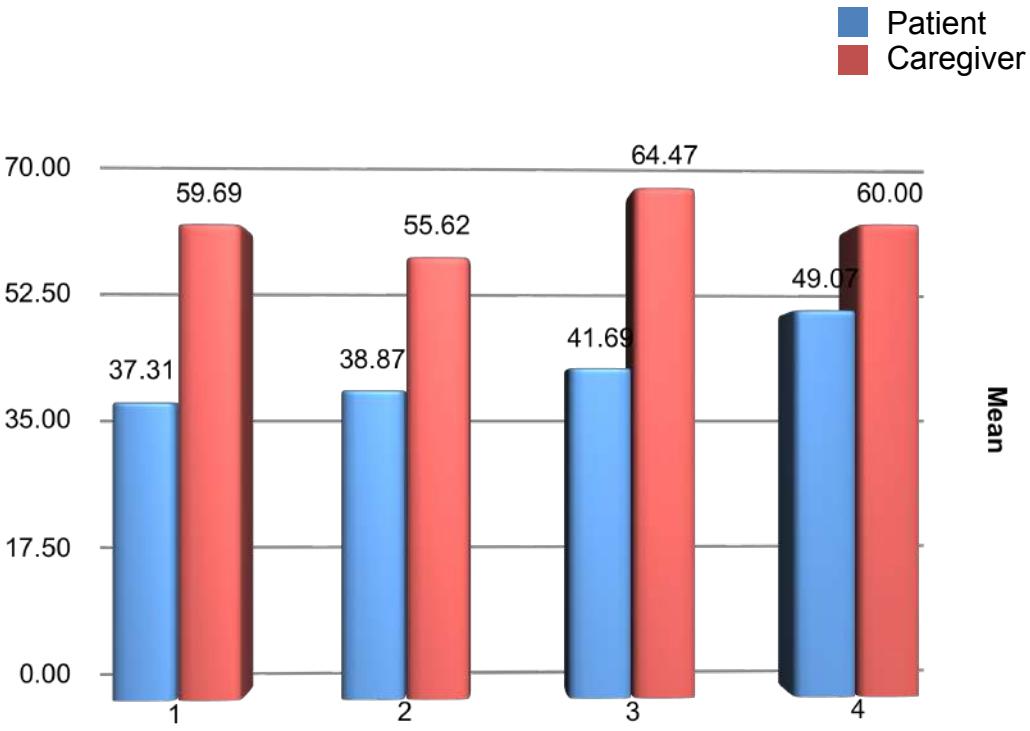


Table 32- CORRELATION OF QOL DOMAINS WITH GOLD 4 COPD

GOLD 4 COPD	N	Correlation	p-value
PHYSICAL DOMAIN 1	45	0.543	**0.003***
PSYCHOLOGICAL DOMAIN 2	45	0.396	**0.007***
SOCIAL DOMAIN 3	45	0.123	0.422
ENVIRONMENTAL DOMAIN 4	45	0.521	**0.023***

Table shows QOL and grade 4 COPD had significant positive correlation on all domains except social domain.

FIGURE 26- SCATTER PLOT SHOWING CORRELATION OF QOL BETWEEN PATIENT AND CAREGIVER IN VERY SEVERE COPD

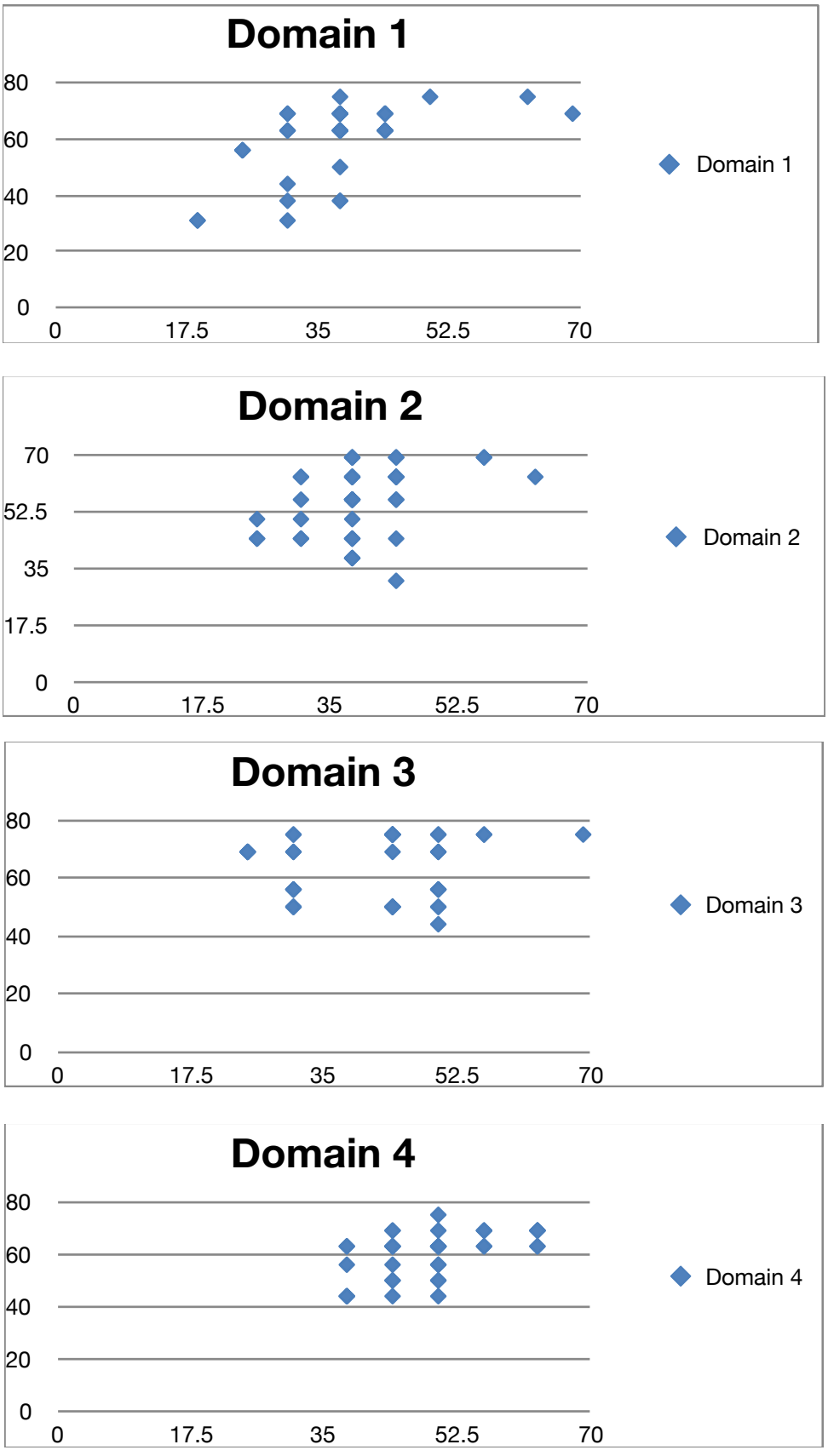
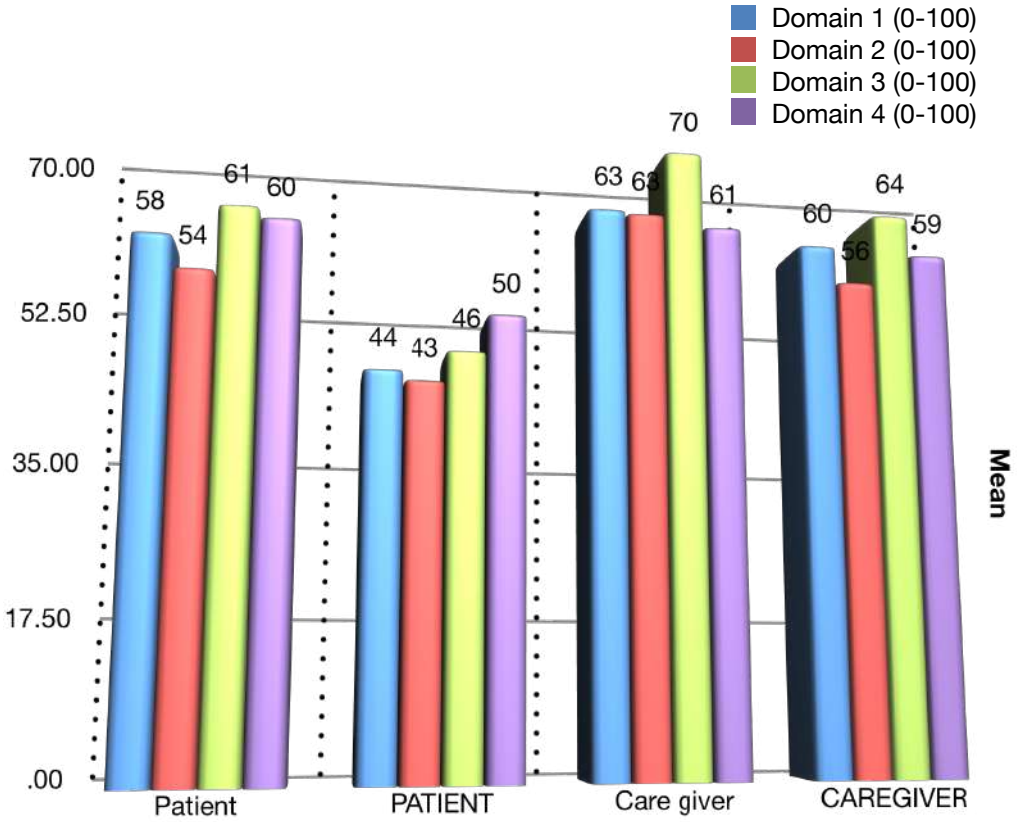


TABLE 33- COMPARISON OF PRESENCE OF PSYCHIATRIC (CO)MORBIDITY WITH QOL IN COPD PATIENT AND CAREGIVER

	PATIENT PSYCHIATRIC COMORBIDITY		CAREGIVER PSYCHIATRIC MORBIDITY	
WHO QOL BREF	NO	YES	NO	YES
PHYSICAL DOMAIN	57.53	43.64	62.85	59.86
PSYCHOLOGICAL DOMAIN	53.82	42.57	62.54	55.68
SOCIAL DOMAIN	61.00	45.95	70.00	63.88
ENVIRONMENTAL DOMAIN	59.82	50.19	61.41	59.34

Table shows presence of psychiatric comorbidity in both patient and caregivers adversely impacts their QOL on all domains.

FIGURE 27- COMPARISON OF QOL OF COPD PATIENT AND THE CAREGIVER WITH PRESENCE OF PSYCHIATRIC (CO)MORBIDITY



RESULTS

The study was conducted in 100 COPD patients (grade 3 and 4 according to GOLD guidelines) and their primary caregivers enrolled from department of General Medicine and Pulmonary Medicine in DMC&H Ludhiana. The data thus collected was tabulated and after analysing, following results were obtained.

Sociodemographic variables in COPD patients

Table 1 and figure 1 show age wise distribution of COPD patients. Out of 100 patients, 61% of them were in the age group of 56-70 years (majority) followed by 24% in the age group of 46-55 years and 15% in the age group of 36-45 years. The mean age of COPD patients was 62.08 ± 10.16 years in our study.

Table 2 and figure 2 show gender wise distribution of COPD patients. Out of 100 patients, 3/4th of them were males (75%) and 1/4th of them were females (25%). In our study, majority of the COPD patients were males.

Figure 3 shows distribution of COPD patients according to the occupation. Out of 100 patients, 38% were either unemployed or retired from work. 23% were self employed as farmers or shopkeepers. 12% were working in a professional job / business. 27% were engaged in skilled / semiskilled or unskilled work.

Figure 4 shows distribution of COPD patients with respect to education. In our study, most of COPD patients i.e. 71% were having middle and high school education. 3% were illiterate, 9% having only primary education, 17% having higher education (diploma, graduate, professional degree).

Table 3 and figure 5 show distribution of COPD patients with respect to their marital status. Majority of the patients in our study were married (83%) and 17% were either divorcee/widow/widower. No unmarried or single patient was there.

Table 4 and figure 6 show distribution of COPD patients according to the severity of the disease based on GOLD staging. Our study included only grade 3 and 4 of COPD patients i.e. severe and very severe COPD. Out of 100 patients, most of the enrolled patients were GOLD 3 COPD (55%) than GOLD 4 COPD (45%).

Figure 7 shows distribution of COPD patients with respect to duration of COPD. 61% patients had COPD since 5-10 years followed by 22% between 11-15 years. 10% had COPD since more than 20 years and 6% had it since 16-2 years. Only 1% had COPD of <5years duration.

Table 5 and figure 8 show distribution of patients with respect to the history of smoking with 42% had positive smoking history.

COPD patients -psychiatric comorbidity and its correlates

Table 6 and figure 9 show relation of COPD patients with presence of psychiatric comorbidity. 83% of the patients reported presence of psychiatric comorbidity whereas only 17% patients had no psychiatric comorbidity.

Table 7 shows the distribution of psychiatric comorbidity in the COPD patients according to the severity of disease. Out of 83% who reported psychiatric comorbidity in table 11, 54.2% belonged to grade 4 COPD and 45.8% belonged to grade 3 COPD. The chi-square value was 16.758 and p value was 0.0001 which was significant. It showed that presence of psychiatric comorbidity in COPD patients was significantly related to increasing severity of the disease.

Table 8 shows the type of psychiatric comorbidity present with the grade of COPD on MINI. Significant difference was seen in presence of MDD/RDD and substance abuse/dependence (non alcohol) where the p values were <0.05 between grade 3 and grade 4 COPD. Out of 31 patients who reported MDD/RDD on MINI, 22 (48.9%) were from GOLD 4 COPD (chi square 12.241, p value 0.001). Similarly, out of 41 patients who were found to be substance dependent (non alcohol), 26 (57.8%) belonged to GOLD 4 COPD (chi square 9.521, p value 0.002).

All psychiatric comorbidities were mostly seen in higher percentage in very severe COPD cases except alcohol abuse/ dependence which was seen in 21.8% of severe cases of COPD and in 8.9% of very severe COPD cases (chi square 3.078, p value 0.079). Anxiety disorders were common in grade 4 than in grade 3 particularly panic attack/ disorder (13.3% of grade 4 COPD, chi square 3.162, p value 0.075).

Figure 10 shows presence of psychiatric comorbidity in COPD patients. Out of 83 patients who reported psychiatric co-morbidities on MINI, substance abuse (non alcohol) abuse/ dependence being most frequent (41%) followed by MDD/RDD (31%) and alcohol abuse/ dependence(16%), dysthymia (14%), GAD (10%) and panic disorder (8%).

Table 9 shows frequency of psychiatric comorbidity with the duration of COPD. The association of psychiatric comorbidity is significantly related to duration of disease (p value 0.003). Majority i.e. 54.2% were present in COPD duration of 5-10 years.

COPD patients - quality of life and its correlates

Table 10 shows mean WHO QOL BREF scores on 4 domains of COPD patients. The transformed scores (0-100) were analysed. Domain 1 i.e. physical- mean score was 46.00 (SD 12.90), domain 2 i.e. psychological - mean score was 44.48 (SD 11.26), domain 3 i.e. social relationship - mean score was 48.51 (SD 14.21) and domain 4 i.e. environmental - mean score was 48.51 (SD 14.21).

Table 11 and figure 11 compares QOL scores of COPD patients with respect to severity of disease. The transformed scores (0-100) on all domains were analyzed. Mean scores on all domains were significantly (p values <0.05) lower for GOLD 4 COPD (37.31, 38.87, 41.69, 49.07) as compared to GOLD 3 COPD (53.11, 49.07, 54.09, 54.09). The confidence intervals (CI) of the mean difference in the scores were 11.71-19.89 for domain 1, 6.18-14.23 on domain 2, 7.28-17.53 on domain 3 and 1.18-8.87 on domain 4.

Table 12 correlates QOL scores of COPD patients with their age. Mean scores on all domains generally decreased with increasing age particularly on physical(1), social(3) and environmental(4) domain (p values <0.05). It showed that advancing age is associated with the declining quality of life of COPD patients.

Figure 12 shows correlation of QOL with gender of COPD patients. Mean scores on all domains were slightly higher for females than males (p values >0.05). It indicated that quality of life of female COPD patients was relatively better than their male counterparts.

Table 13 shows correlation of QOL of COPD patients with occupation. It was found to be independent of occupation (p values >0.05).

Figure 13 correlates QOL of COPD patients with their marital status. The mean scores were higher in all domains in married patients as contrast from divorced /widow/ widower patients. It showed that quality of life was better in married patients than in divorced/ widow/ widower group.

Table 14 and figure 14 shows correlation of QOL of patient with presence of psychiatric comorbidity. The mean scores on all domains of BREF scale decreased significantly (p value <0.05) with presence of psychiatric illness (43.64, 42.57, 45.95, 50.19) as compared to no psychiatric comorbidity (57.53, 53.82, 61.00, 59.82).

Table 15 shows relation of MDD / RDD, substance abuse / dependence (non-alcohol) and alcohol abuse / dependence with QOL in COPD patients. The mean scores decreased with their presence significantly on domain 1, 2 and 3 with MDD/RDD (p values <0.05) and not so significantly with others.

Sociodemographic variables in Caregivers of COPD patients

Figure 15 shows distribution of caregivers of COPD patients with respect to age. Out of 100 caregivers, 39% were in age group of 46-60 years, 30 % in age group of 31-45 years. Mean age of caregivers was

56.16 ± 12.14 years. 16% caregivers were in age group of 18-30 years and 15% were >60 years.

Figure 16 shows distribution of caregivers with respect to gender. Majority of the caregivers (54%) were males and females were 46%.

Table 16 and figure 17 shows caregiver distribution according to the relationship with the COPD patient. 42% were related as spouses, 33% were child of the patient, 13% were related as son/daughter in law, 9% related as parents and 3% as siblings of the COPD patients. As majority of them were in age range of 46-60 years, hence related as spouses.

Table 17 and figure 18 show distribution of caregiver with regards to duration of living together with the patient. Out of 100 caregivers, 37% were living with the patient for 21-30 years followed by 21% for 31-40 years (mostly spouses/children). The average duration of living together was 24.17 ± 7.35 years. 16% of caregivers were living together for 10-20 years and 16% were living for 41-50 years. 4% were living with the patient for <10 years and 6% had been living together for >60 years (mostly parents).

Table 18 and figure 19 show caregiver distribution with respect to severity of COPD of the patient. 56% were caregivers of GOLD 3 COPD patients and 44% were of GOLD 4 COPD patients.

Caregivers of COPD patients -psychiatric morbidity and its correlates

Table 19 shows psychiatric morbidities in caregivers of COPD patients assessed by MINI. 59% caregivers reported psychiatric morbidities whereas 41% did not. Out of the psychiatric morbidities, alcohol abuse/dependence was the most common (23%) followed by substance abuse/ dependence (non-alcohol) (13%). Others were MDD/RDD, dysthymia and generalized anxiety disorder (10% each).

Table 20 correlates the presence of psychiatric morbidity in caregivers with grade of COPD in patients. The association of frequency of

MDD/RDD, dysthymia, panic disorder and generalized anxiety disorder was more with GOLD 4 COPD caregiver than GOLD 3 COPD although the correlation was not significant (p values >0.05). The presence of substance abuse/ dependence (alcohol and non-alcohol) and social phobia was present more frequently in GOLD 3 COPD caregivers as compared to GOLD 4 stage of the disease (p values >0.05).

Caregivers of COPD patients -quality of life and its correlates

Table 21 shows mean transformed (0-100) scores on domains of WHO QOL BREF scale of caregivers of COPD patients. The mean scores on physical domain was 61.09 (SD 11.83), on psychological domain was 58.49 (SD 10.02), on social domain was 66.39 (SD 10.22) and on environmental domain was 60.19 (SD 8.51).

Table 22 and figure 20 compares QOL scores of caregivers with the severity of COPD of the patients. The mean scores on all 4 domains of WHO QOL BREF were lower for caregivers of very severe COPD (60.34 (SD12.07), 55.89(SD10.56), 64.36(SD10.87), 60.05(SD8.41)) than for caregivers of severe COPD patients (61.68 (SD11.71), 60.54(SD9.15), 67.98(SD9.48), 60.36(SD8.65)). Only on the psychological domain, the mean difference of 4.65 (standard error 1.97) between the 2 groups was statistically significant (p value 0.020) i.e. QOL on psychological domain was significantly worse for caregivers of very severe COPD patients than the ones of severe COPD patients.

Table 23 correlates QOL of the caregivers with their age. It showed that on all domains, the QOL was better in young caregivers than the older ones and this finding was statistically significant for all domains on WHO QOL BREF scale (p values <0.05).

Table 24 and figure 21 show correlation of QOL of caregiver with the relationship to the patient. Generally, the scores were higher for son/daughter in law followed by child/spouse/sibling followed by parents an all domains. Hence parents had lower quality of life than child/spouse/ sibling. Son/daughter in law had relatively better quality

of life, statistically significant (p value <0.05) on physical, psychological and environmental domain.

Table 25 and figure 22 correlates QOL of caregiver with presence of psychiatric morbidity in them. All domains showed lower scores if psychiatric morbidity was present in caregiver. It was significantly correlated (p value <0.05) on psychological and social domain where the mean score was found to be 55.68 ±10.033 (p value 0.001) and 63.88 ±10.845 (p value 0.003) respectively. Hence psychological and social quality of life is affected significantly in caregiver if psychiatric morbidity is present in them.

Table 26 shows correlation of QOL of caregiver with MDD/RDD and it was found that presence of MDD/RDD in caregiver worsened the quality of life particularly psychological, social and environmental domain (p values <0.05).

Table 27 and 28 shows correlation of presence of alcohol abuse/ dependence and substance abuse/ dependence respectively with the QOL of caregiver. Although these psychiatric morbidities showed declining quality of life in caregivers but none were statistically significant on any domain of WHO QOL BREF scale.

Table 29 and figure 23 shows comparison of QOL between patient and caregiver in severe (GOLD 3) COPD. The mean scores on all 4 domains of WHO QOL BREF were lower for patient (53.11 (SD 10.92), 49.07 (SD 11.77), 54.09 (SD 14.79), 54.09 (SD 11.06)) than for the caregiver (62.24 (SD 11.05), 60.84 (SD 8.95), 67.96 (SD 9.56), 60.35 (SD 8.45)). This indicated that in severe COPD cases, patients have worse quality of life than their caregivers on all domains of physical, psychological, social and environmental (p values <0.05).

Figure 24 and table 30 show the corresponding scatter plot and tabular form, respectively, for correlation of QOL of patient and caregiver with severe COPD (GOLD 3) stage. All the domains of QOL on BREF are

significantly related to severe COPD both for patient and caregiver (p values <0.05 for all domains).

Table 31 and figure 25 shows comparison of QOL between patient and caregiver in very severe (GOLD 4) COPD. The mean scores on all 4 domains of WHO QOL BREF were significantly lower for patient (37.31 (SD 9.38), 38.87 (SD 7.52), 41.69 (SD 9.97), 49.07 (SD 7.52)) than for the caregiver (59.69 (SD 12.71), 55.62 (SD 10.59), 64.47 (SD 10.77), 60.00 (SD 8.67)). This indicated that in very severe COPD cases, patients have worse quality of life than their caregivers on all domains of physical, psychological, social and environmental (p values <0.05).

On comparing table 29 and 31, it showed that QOL of both patients and caregivers declined on all 4 domains with increased severity of COPD of the patient.

Table 32 and figure 26 show the corresponding tabular form and scatter plot, respectively, for correlation of QOL of patient and caregiver with very severe COPD (GOLD 4) stage. All the domains of QOL on BREF are significantly related to very severe COPD both for patient and caregiver except for the social domain (p values <0.05 for all domains except for social domain (domain 3)).

Table 33 and figure 27 compares QOL of patients and caregivers with presence of psychiatric co-morbidity. With presence of psychiatric diagnosis, QOL scores decrease with respect to the group with no psychiatric diagnosis. The QOL scores of patient were lower than their caregivers whether or not with the presence of psychiatric comorbidity. It indicates that COPD patients generally have poor QOL as compared to their caregivers regardless of the presence of the psychiatric comorbidity (as depicted in the figure 27 corresponding to table 33).

DISCUSSION

COPD is distinguished by its persistent and progressive airflow limitation. Psychiatric disorders generally co-exist with COPD but they often remain undiagnosed. The interplay of demographic characteristics, clinical findings, disease severity and mental health of not only the COPD patients but also their caregivers will determine their own QOL as well as the influence on each other. The severity of COPD is graded by GOLD guidelines 2018 [8] based on FEV1/FVC ratio in which GOLD 3 and 4 refer to severe and very severe forms of COPD. It not only affects the mental health and QOL of the patient but also of the caregiver. The caregiver's burden describes the accumulation of problems ranging from the stress involved in care-taking to social and financial problems that eventually damages a caretaker's own professional and social life, physical and mental health, financial prosperity and overall QOL.

PATIENT DATA

DEMOGRAPHIC VARIABLES

This study consisted of 100 patients and their caregivers. The mean age of patients in our study was 62.08 ± 10.16 with age ranging between 25-70 years. 61% of the patients diagnosed with grade 3 or 4 COPD were between 56 to 70 years. As COPD is a chronic medical illness and our study included only the severe and very severe cases of COPD, patients were usually of advanced age when they present to hospital with exacerbations and complications of the disease.

The results with respect to age were concordant with the study by **Kahraman et al (2013)** [64] where mean age of patients was 63.17 ± 9.87 years (age range of 44 - 83 years). Similarly, in an Indian study by **Kumar et al (2012)** [160], the mean age of patients was 55.67 ± 12.45 years. The results in the study conducted by **Chaudhary et al (2016)** [41] found the mean age to be 56.97 ± 10.11 years.

Our study had 75% male and 25% female patients. Similar results with respect of gender were seen in study by **Chaudhary et al(2016)** [41],

Kumar et al (2012) [160] and **Sharma et al(2013)** [42] in which the male COPD patients were more than females as COPD is more prevalent in men because of increased tobacco use in the form of smoking [161]. However, there is a shift in the gender paradigm recently [162,163] due to greater cigarette consumption in women, exposure to biomass fuel burning and Chula smoking.

Our study recorded that the most of our COPD patients were currently not working (61%) which can be attributed to old age as well as to the debilitating physical effects of COPD on the patient. An American Health and Retirement Study by **Thorton et al (2012)** [35] and **Cleland et al (2007)**[94] substantiated that COPD was associated with a decrease in the likelihood of employment by 8.6% and this was also one of the reason for consequent deteriorating mental health of COPD patients and occurrence of psychiatric co-morbidities in them.

As far as the educational level of patients in our study is concerned, majority of them were educated with high level of schooling while 12% were below middle school level of education. Our results were comparable to study by **Prescott et al (1999)** [164] whereas it is in contrast to study by **Gjerdevic et al (2014)** [165] where around 30% of the patients were below middle school education. This variability can be attributed to the source of data in our study which is from a private tertiary care centre.

In our study, majority of the patients were married and 17% were either divorced or lost their spouses. They were dependent on their families for economic support as they were old and had either retired or were unemployed. The results were consistent with regard to marital status and occupation to study by **Chapman et al (2006)** [34] and **Guntun et al (2012)** [121] where the COPD patients were mostly married, retired from their workplaces and having their spouses as the primary carers.

EFFECT OF GRADE OF COPD

In our study, most of the COPD participants had grade 3 (severe) COPD (55%) (according to GOLD staging) than grade 4 (very severe) COPD (45%) and the duration of COPD was between 5-10 years for majority of the patients. These results are congruous with study by **Chaudhary et al (2016)** [41] in which majority of the patients (60.8%) had severe COPD as per GOLD criteria. However, the duration of symptoms was <5 years in most of their cases (77%) with the mean duration of 4.94 ± 3.78 years. This difference can be explained by potential recall bias in cases of non-availability of medical records and due to tertiary level of contact of patient with us. In contrast to our study, **Cleland et al (2007)** [94] showed only 20 % of the COPD patients in grade 3 and 4 GOLD stages because their study took into account all stages of COPD.

RELATION TO SMOKING

The association of smoking with COPD is irrefutable as it is one of the main cause in pathogenesis of COPD [4]. Our study showed 42% of the subjects were smokers which is consistent with study by **Cleland et al (2007)** [94] where 46% of the patients were current smokers. In a study in Northern Sweden by **Lindberg et al (2006)** [47], the prevalence of COPD among men who were either current or ex-smokers was 89%. We, in our study, did not include the ex-smokers.

PSYCHIATRIC CO-MORBIDITY IN COPD PATIENTS

Regarding the presence of psychiatric co-morbidity in COPD patients, our study showed 83% prevalence among our patients by using MINI version 5.0.0 which is quite a large and significant number. Its association increased with the severity of the grade. In the study by **Chaudhary et al (2016)** [41] in which COPD patients (mostly males with positive smoking history) had psychiatric comorbidity of 28.4% as compared to 2.7% in controls (P = 0.005) by using MINI. The frequency of their presence increased with the severity of COPD as in our study. The frequency of comorbidities in Grade IV COPD was 53% as com-

pared to 16.67% in Grade I/II (P = 0.035). The frequency was also affected by the duration of symptoms. In patients with duration of symptoms <5 years, the frequency was 22.8% compared to the frequency of 66.67% in patients with symptoms more than 10 years (P < 0.001).

Similarly, in an Indian study conducted by **Sharma et al (2012)** [42] the prevalence of psychiatric comorbidity was estimated to be around 44.8% as compared to 24.3% in controls by using Global Mental Health Assessment Tool-Primary Care version.

Data from a study by **Neeraj Kanwar et al (2019)** [166] showed that 43% patients had psychiatric comorbidities.

According to meta-analysis by **Hong-lei Yin et al** [167], the prevalence of neurological and psychiatric disorders (OR 1.78, 95% CI 1.48–2.14; P<.00001) was significantly higher in COPD patients in comparison with controls.

In another study from India, by **Shabir et al** [43] , cases had psychiatric comorbidity of 47% as compared to 12% in controls (P = 0.005) which was also significant. They found that depression is a highly prevalent comorbidity in patients with COPD (frequency of 28%).

COPD AND DEPRESSION

It was reported that COPD patients have two to three fold higher prevalence of depression in comparison to non COPD patients [44]. Particularly, mood disorders (major depression, dysthymia) and anxiety disorders (generalized anxiety disorder, phobias and panic disorders) are common in patients with COPD [47].

Our study showed the prevalence of Major Depressive Disorder to be 31% which is congruous to the study by **Negi et al (2014)** [56] who depicted a prevalence of depression of 33%. Comparably, **Maurer et al. (2008)** [39] and **Mikkelsen et al. (2004)** [40] found prevalence of depression in COPD patients to vary from 10% to 42% and 6% to 57% respectively.

In study by **Chaudhary et al (2016)** [41], the frequency of clinically significant depression was 8.1% in cases as compared to 0% in controls. The prevalence of depression as observed by **Sharma et al (2013)** [42] was 13.2%. However, studies from other countries reported the prevalence of depression in patients with COPD varying from 6% to 56% [168-170].

Recent studies by **Dowson et al (2001)** [86] and **Lacasse et al (2001)** [171] have found depression in COPD patients a range of 42%–57%. Other studies by **Ng et al (2007)** [52] also indicate that there is a high prevalence of anxiety and depression in patients with COPD (44.1%).

In a review of three studies, **Solano et al. (2006)** [53] had observed the prevalence of depression ranged from 37% to 71% of COPD patients. A study done in Indian COPD patients (**Jones 1991**) [172] has shown the cumulative prevalence of depression in 72% of patients. Studies from other countries such as **Japan** and **Turkey** 2011 reported the prevalence of depression in patients with COPD ranging from 40.5% to 46.7% [54,55].

COPD AND SUBSTANCE / ALCOHOL ABUSE / DEPENDENCE

Our study showed 41 out of 100 patients being substance dependent (non-alcohol). Substance abuse/dependence (non-alcohol) was present in 57.8% of grade 4 COPD as compared to 16.4 % of grade 3 COPD patients (P=0.002). Alcohol abuse / dependence was present in 16 % patients although it showed no significant difference between the grades of COPD (P=0.079). An Indian study by **Dua et al (2018**) [57] found that 22.4% patients with COPD had depression as the major psychiatric comorbidity and substance abuse was the second most common.

COPD AND ANXIETY SPECTRUM DISORDERS

In our study, 23% patients had anxiety spectrum disorders including generalised anxiety disorder and panic attack/ disorder. Similar to our results, in the study by **Sharma et al (2013)** [42], anxiety disorders ac-

counted for 20.6% of the cases. Correspondingly, **Kunik et al (2005)** [51] and **Willgoss et al (2013)** [62] showed clinical anxiety as a significant problem in COPD, with an estimated prevalence of up to 40% which is higher than our results.

Differing from our study, **Chaudhary et al (2016)** [41] found the frequency of anxiety disorders was 9.5% as compared to 1.4% in controls whereas study by **Kahraman et al (2013)** [64] found that the prevalence of anxiety in COPD patients was 30.7% as compared to 16.4% in controls as they considered all grades of COPD patients. Reviews of studies that have examined feelings of anxiety in COPD patients report prevalence ranging 2–96% [40, 173]

In our study, Panic attack/disorder was seen in 8% of the cases and showed difference between the grades of COPD - being more common in very severe COPD than severe COPD but was not statistically significant (P=0.075). COPD patients are ten times more likely to experience panic attacks compared with general population samples (**Livermore et al 2010**) [174]. Similar to our study, **Shabir et al** [43] found panic disorder in 9% of the cases. Similarly, **Karajgi et al (1990)** [65] using the Structured Clinical Interview for DSM-III-R, found a prevalence rate of 8% for panic disorder which is 5.3 times as high as in the general population. **Porzelius et al. (1992)** [175], however found that 37% of patients experienced a panic attack. **Moore and Zebb (1999)** [66] on the other hand have however found an even higher rate of panic disorder (32%) using self-report measures of panic disorder symptoms based on DSM-IV criteria for panic disorder. The differences are attributed to the type of objective questionnaire used in each study to measure that particular variable.

Dysthymia (14%), generalized anxiety disorder (10%), and suicidality (2%) were the other co-morbid diagnosis in our study. The results were in tune to the prevalence of generalized anxiety disorder among patients with COPD which ranges from 10% to 15.8% when using standard diagnostic procedures in study by **Aghanwa et al and Aydin et al**

(2001) [67-69] compared with lifetime rates of 3.6% to 5.1% in the general public [70,71].

Similar to our finding, the prevalence of generalised anxiety disorder ranged 10–33% **(Dowson et al 2004)** [72]. The prevalence rates of anxiety spectrum disorders in patients with COPD ranges between 10% and 19% in patients with stable disease as documented by **Maurer et al (2008)** [61]

PSYCHIATRIC COMORBIDITY AND SEVERITY OF COPD

In the study by **Chaudhary et al (2016)** [41] , the frequency of psychiatric comorbidities increased with the severity of COPD (more in severe and very severe COPD) which is akin to our study. This finding was statistically significant (P = 0.035). In the same study, there was a significant difference in the frequency of psychiatric comorbidities with duration of symptoms of COPD (P < 0.001) being present in 67% of patients with duration of symptoms more than 10 years and only 23% of patients with duration of symptoms ≤5 years.

The prevalence increased with the severity of COPD. In our study, 48.9% of GOLD 4 COPD and 16.4 % of GOLD 3 COPD patients showed presence of Major Depressive Disorder (current or recurrent) (P=0.001). However, **Van Ede et al (1999)** [49] found prevalence of depression being 6% to 42% in patients with moderate-to-severe COPD.

Another recent meta-analysis by **Zhang et al (2011)** [48] on COPD patients and controls found that 1 in 4 COPD patients experienced clinically appreciable depressive symptoms compared with less than 1 in 8 of the controls (24.6%, 95% confidence interval [CI] 20.0–28.6 versus 11.7%, 95% CI 9.0–15.1). The findings are consistent with the one of previous qualitative and quantitative reviews that assessed the prevalence of depressive symptoms in COPD [49-51]. In a systematic review, the prevalence of depression in patients with moderate-to-severe COPD ranged 7–42% [76,77].

There is no standardized approach for the diagnosis of depression in COPD patients because of the differences in the methodology and variability of the screening questionnaires in cut-off points to determine a diagnosis of depression. Hence, the wide range that is observed among different studies.

In a study by **Asuka et al (2013)** [78], it was found that there was a weak correlation (r = −0.29, P = .01) between the severity of air-flow limitation (FEV1), and the Center for Epidemiologic Studies Depression scale (CES-D) score. The prevalence of depression increased with BODE stage, being 12.5% in stage I, 45.5% in stage II, 38.2% in stage III, and 75% in stage IV (P = .02). The effect of depression on the health-related QOL of patients with COPD is also a serious problem. Using the SGRQ to assess health-related QOL, a significant correlation was found between the presence of depression and the domains of activity of QOL.

The incidence of depression, in a longitudinal study by **Schneider et al (2010)** [108] (n = 35,000 COPD) with a follow-up of 10 years, was 16.2 cases per 1000 person-years in the COPD group compared to 9.4 cases per 1000 person-years in the non-COPD control group. It varied with the severity of COPD, being twice the likelihood in severe COPD than the mild cases (**meta-analysis 2013).** [109]

There are studies reporting that in severe stages of COPD, depression had ranged from 24% to 42% in **international studies** [79-83] and from 30% to 36% in previous studies from Japan [84,85].

Van Manen et al (2002) [79] also assessed the prevalence of depression with severity of lung function in COPD patients, using the CES-D and it was found that prevalence of depression is 19.6% in patients with mild to moderate COPD, and 25.0% in patients with severe COPD, suggesting an association between the severity of lung function and depression.

Dowson et al (2001) [86] reviewed the prevalence of depression and anxiety using the HADS in COPD patients and found that those with more severe COPD had higher scores of depression and anxiety. **An et al (2010)** [87] and **Funk et al (2009)** [88] also showed that severity of lung function (FEV1) in COPD is related to depression in patients with COPD which is also accordant in our study.

Similarly, the study by **Christian et al (2015)** [92] found that the prevalence of anxiety (HADS-A: 84.9 %) and depression (HADS-D: 58.8 %; PHQ-9: 60.6 %) was higher with moderate to very severe COPD of comparable age. The frequency of somatisation (PHQ-15: 81.8 %) was also high in severe group in comparison to the general population (PHQ-15: 9.3 %). [95]

COPD AND QOL

Our study assessed the QOL of COPD patients by using WHO-QOL BREF scale and found the correlation of the severity of COPD with quality of life. The QOL was affected in all 4 domains. The mean scores of all 4 domains (physical, psychological, social and environmental) on WHO-BREF were less in grade 4 COPD (37.31(SD 9.38),38.87(SD 7.52), 41.69(SD 9.97), 49.07(SD 7.52)) than in grade 3 COPD (53.11(SD 10.92), 49.07(SD 11.77), 54.09(SD 14.79), 54.09(SD 11.06)) as the P value <0.05 on all domains (CI of domain 1- 11.71 to19.89, CI of domain 2- 6.18 to 14.23, CI of domain 3- 7.28 to 17.53) and CI of domain 4- 1.18 to 8.87). This represented deteriorated QOL of patients with severe and very severe COPD and poorer in the latter group due to the disease process which causes restrictions in physical mobility, compromised activities of daily living and increase dependence on medical aids and also on family members. Chronic loss of energy, fatigue, pain, discomfort and decreased work capacity leads to decreased self-esteem and loss of self-image. This makes COPD patients vulnerable to declining physical and mental health.

In studies by **Prigatano et al** [176]**, Ferrer et al** [177] **and Wijnhoven et al (2001)** [178]**,** older age, presence of co-morbid illness, less education,

and greater smoking consumption resulted in decline in QOL of COPD patients.

In an Indian study by **Shavro et al (2012)** [179] COPD patients showed significantly reduced HRQoL when measured by the WHOQOL bref and the SGRQ. Duration of illness ($P < 0.05$) showed close correlation with HRQOL. Contrast to our study, no association was found between QOL and age or education or co-morbid illnesses.

CORRELATES OF QOL IN COPD PATIENTS

COPD puts a significant impact on QOL of patient [96]. HRQoL is a multifaceted concept linked to health or illness. It includes a number of distinct domains corresponding to the physical, social, and psychological impact of illness [98]. **Chetty et al (2017)** [97] showed that comorbidity is associated with higher levels of hospitalisation, polypharmacy, poor QOL and higher mortality.

In our study, when QOL was analysed with other variables, it was found to be independent of occupation of patient i.e. no statistical difference was found in any of the 4 domains (P value insignificant). It was associated with age (P=0.031 on physical domain, P=0.001 on social domain and P=0.01 on environmental domain). Similar to our study, **Balcells et al (2010)** [91] demonstrated that age is one of the most important factors affecting COPD patient's QOL.

Domain 4 (environmental) that addresses the financial resources, security, accessibility, transport, home and physical environment was found to related to education (P=0.001) and income (P=0.004). It reflected that educated patients having a fair amount of income regardless of the occupation contacted the medical facility for advise. QOL was better on all 4 domains in married patients than patients who were either divorced or lost their spouse (P values <0.05). **Martinez- Rivera et al (2011)** [99] **and Miedinger et al (2011)** [100] also showed that gender, education, marital status, socioeconomic status as well as smok-

ing are other factors determining the patients' psychological distress and QOL of COPD patient [91,99,100].

Our study also demonstrated that the QOL was better in all domains for females than in males perhaps due to early acceptance of the disease and seeking medical attention. Similarly, **Bakas systematic review (2012)** [98] concluded that females are more concerned and expressive about their health and illness, so they tend to start the treatment early which results in relatively better QOL than their male counterparts.

Our study depicted that presence of psychiatric comorbidity significantly affected all domains of QOL (P values <0.001 on all domains). Principally with presence of Major Depressive Disorder, the physical, psychological and social domains were affected (P values <0.05) whereas no statistical gravity was seen with substance or alcohol abuse/ dependence. This reflects that depression as comorbidity in COPD affects QOL in a more crucial manner than substance or alcohol abuse/ dependence.

In line with our study, **Hajiro et al (2000)** [89] reported an association between depression and QOL. **Quint et al (2008**) [90] and **Balcells et al (2010)** [91] stated that the presence of depression seemed to decrease QOL when measured using the SGRQ, thus indicating that depression is significantly related to declining QOL in COPD patients.

Constant with our results, **Martinez-Frances et al (2008)** [101] suggested that symptoms of depression and anxiety are associated with poorer HRQoL in COPD. A recent systematic review by **Blakemore et al (2014)** [102] had examined the longitudinal impact of depression and anxiety on HRQoL. This review found that both depression and anxiety at baseline are significantly associated with worsening levels of HRQoL at 1 year follow-up (pooled r=0.48, 95% CI 0.37–0.57, P<0.001; pooled r=0.36, 95% CI 0.23–0.48, P<0.001; for depression and anxiety, respectively).

Sundh et al (2011) [180] found that in COPD patients, illness like cardiac diseases, depression, and low body weight were independently associated with a poor QOL.

In a population-based sample of those with and without COPD (n=476), **Lu et al (2012)** [103] found that stress related to decreased energy, anxiety, and fear/panic in response to breathing difficulties was associated with increased depressive symptoms and impaired QOL among patients with COPD compared to age-matched controls.

Andenaes et al (2004), Yohannes et al (2005), Gudmundsson et al (2005) and Fan et al (2002) highlighted that anxiety and depression are common comorbidities of COPD which have relationship with exacerbations of COPD and QOL of the patient [104-107]. **Gudmundsson et al (2006)** [75] suggested that untreated depression and anxiety have major implications on QOL, increased frequency of admissions and prolonged length of stay.

The frequent psychiatric comorbidity in study by **Chaudhary et al (2016)** [41] were substance abuse disorder (16.21%), followed by dysthymia (5.7%) and depression (2.7%) which all led to decrease in QOL of COPD patients.

A study by **Einser and colleagues in 2010** [110] reported that COPD patients with comorbid anxiety disorders are twice as likely to exhibit lower self-esteem, predispose to suicidal ideation, and deteriorating QOL. Presence of irritability and hopelessness in COPD patients also decrease the QOLin these patients [111].

CAREGIVER DATA

The act of caregiving is exhaustive in cases of chronic illnesses like COPD. **Cain et al (2000)** [115] and **Seamark et al (2004)** [116] described it as physically, emotionally, and financially demanding work, which creates high caregiver burden, making them prone to mental illness, and is associated with a decrease in their QOL.

The gradual disability developing in patients leads to dependence on family members assistance, who become central to provide support (**Bergs, 2002)** [157]. COPD becomes highly distressing for both patients and family carers. Recently, negative psychological impacts on patients with COPD have been reported, but limited research has been conducted in view of the same.

Wakabayashi et al (2011) [120] highlighted that an informal caregiver is associated with better adherence to treatment, a reduced rate of smoking, better physical and mental health outcomes and less frequent emergency visits compared with those for patients living alone [112-114].

The assumption that a caregiving role impacts on family carers' psychological health is well documented for other chronic diseases. In caregivers of patients with dementia, cancer, or stroke, 40% to 51% have anxiety (**Greenwood and Mackenzie, 2010; Mitchell *et al.*, 2013**) and 18% to 33% depression (**Berg *et al.*, 2005; Grov *et al.*, 2005; Greenwood and Mackenzie, 2010; Mitchell *et al.*, 2013**).

DEMOGRAPHIC VARIABLES

Our study involved 100 patients and their primary caregivers. The mean age of the caregivers in our study was 56.16 ± 12.14 years with 39% of the them between 46 to 60 years and 30 % between 31-45 years of age. The results of our study with respect to age were concordant to study conducted by **C. Jacome et al (2014)** [152] with mean age of family carers of COPD (n=203) was 58.2 ± 14.8 years old. Distinguishing it from the Indian study by **Kumar et al (2012)** [160] the mean age of caregivers (n=46) was 38.74 ± 14.66 years. The difference is explainable by the large sample size and inclusion of only severe grades of COPD in our study.

Our study had 54% male caregivers and 46% as female. Similar results with respect of gender were seen in study by **Kumar et al (2012)** [160] in which 52% of COPD carers were males. However, in study by **Jacome et al (2014)** [152] (n=203) 75.4% were female carers because most of

the patients (63.5%) in their study were male and the carers were spouses, so the female carers were more in their study. Our study had male preponderance both in patients (75%) and their caregivers (54%) which could be explained by the fact that mostly the patient is accompanied to the hospital by a male family member particularly in our set up as the females stay back to take care of the household.

Our study documented the kin relationship often as spouse (42%) or the child (33%) of the patient similar to **Jacome et al (2014),** [152] **del-Rio Lozana et al (2013),**[122] **Pinto et al (2007)** [117] and others [123,124,142,143,156,157]

CAREGIVER AND PSYCHIATRIC MORBIDITY

Our study demonstrates that 59% of the caregivers had psychiatric morbidity out of which alcohol and substance (non-alcohol) abuse/ dependence was the most frequent (36%) followed by depression (10%), dysthymia (10%) and generalised anxiety disorder (10%), perhaps as the majority carers in our study were males (spouse/son).

In the study by **Jácome et al (2014)** [152] it was found that family carers have significant anxiety and depression symptoms, and their subjective burden, female gender and older age were significant predictors of these distressing symptoms.

The frequencies of anxiety (63.5%) and depression (34%) symptoms in family carers of patients with COPD are in line with those observed in family carers of people with dementia, stroke, or cancer as shown in studies by **Covinsky et al (2003), Berg et al (2005) and Grant et al (2012)** respectively,[153,154,181] highlighting the similar demanding and stressful nature of the caregiving role in chronic diseases like COPD.

In our study, Caregivers of GOLD 4 patients had higher frequency of psychiatric morbidity like depression, dysthymia and anxiety spectrum disorders (13.6%, 13.6%, 25% respectively) than caregivers of GOLD 3 patients (7.1%,7.1%,14.3% respectively) although the comparison between the groups was statistically not significant (p values >0.05). Simi-

lar to our study, **Simpson et al (2008)** also concluded that caregivers experience a decline in psychological and physical functioning, towards the advanced stages of COPD [144]. Another study by **Figueiredo et al (2014)**, caregivers of patients with advanced COPD (grade 3 and 4 of GOLD staging system) had more symptoms of anxiety and depression, and their self-rated health was significantly worse when compared with caregivers of patients with early COPD (stage 1 and 2) [145].

Another study by **Miranda et al (2011)** [146], showed that 72% of the caregivers of severe and very severe COPD had symptoms of anxiety and 26% had symptoms of depression during discharge from hospital, thus reported higher frequency of presence of psychiatric symptoms.

According to study by **Ng et al (2009)** [158], the functional decline contributes to the development of carers' subjective burden which, in turn, affects their psychological health and QOL and is particularly remarkable for depression, since those who were caring for people with advanced COPD (severe and very severe) presented higher clinically significant depression symptoms. This result was expected since patients at advanced COPD experience a higher degree of physical disability and, thus, an increasing dependence on their family carers. Conversely, no differences on anxiety symptoms between early and advanced COPD were found according to **Boyle et al (2009)** [159].

CAREGIVER AND QUALITY OF LIFE

In our study, the caregivers' quality of life measured using WHO QOL BREF scale showed lower transformed scores particularly in domains 2 (psychological) and 3 (social) in carers of GOLD 4 patients as compared to carers of GOLD 3 patients. The statistically significant difference was however seen on domain 2 scores ($p = .020$, CI of 0.73-8.56) while domain 3 was insignificant ($p=0.079$).

Similar findings were found in study by **Kumar et al (2012)** [160] which showed the caregivers had a compromised quality of life as is evident by the scores on domains (4-20) (12.11 ±1.71, 11.67 ± 2.24, 12.85 ±

1.96, 12 ± 1.28). Our study scores (13.74 ± 1.88, 13.33 ± 1.60, 14.62 ± 1.63, 13.59 ± 1.35) were slightly better as our sample size was large and also the source of data was from carers of patients who present to a private tertiary care facility.

Figueiredo et al (2014) [145] demonstrated that caring for people with advanced COPD reported higher subjective burden, more depression, and poorer QOL than did those caring for people with early COPD.

Another study by **Miravitlles et al (2007)** [182] done to determine the QOL of caregivers demonstrated that COPD caused a significant impact on quality of life of caregivers support the finding of our study. The parameter used to assess the QOL of caregiver was SF-36 whereas we relied on WHO- QOL BREF scores

As per **Janssen et al (2012),** patients and caregivers may have different perceptions of the patients' health status which has a negative influence on the caregivers' QOL [148,149].

Other correlates of QOL in caregivers of COPD patients includes age of the caregiver, which in our study, was significantly associated with higher scores on all the 4 domains of WHO QOL BREF scale ($p < 0.05$). The mean scores on domains 1,2 and 4 were also higher and significant ($p < 0.05$) with respect to kin relationship of the caregiver indicating better quality of life in spouses and children of the patient as they got the emotional and social support of each other. However, the QOL scores were independent of the gender of the carer. Our study depicted lower scores on BREF scale by caregivers with history of psychiatric morbidity especially depression particularly on domains 2 and 3 of QOL BREF scale indicating a negative impact of presence of psychiatric morbidity in the caregiver on their quality of life.

These findings are evidenced in studies by **Ivziku et al (2019)** [183] by using Short-Form Health Survey (SF-12) to measure QoL (n=80), that showed that patients presented poorer physical and mental QoL than their caregivers.

COMPARING PATIENT AND CAREGIVER QOL WITH SEVERITY OF COPD: caregiver mean scores on all domains of WHOQOL BREF scale are higher than the patient mean scores in both grade 3 and 4 COPD stages and is significantly higher ($p = 0.001$) indicating that quality of life of caregiver was better than the patient in both the grades.

However, the mean scores of patient and caregivers were lower for GOLD 4 COPD than for the GOLD 3 COPD indicating that as the severity of the disease increases, QOL of both the patient and their caregiver worsens, hence showing that they affect each other in a bidirectional manner similar to **Trivedi et al (2012)** [119]

SUMMARY AND CONCLUSION:

This study was conducted on 100 COPD patients (GOLD grade 3 and 4) and their caregivers to assess the prevalence of psychiatric co-morbidities and the impact on their QOL. The data thus obtained was analysed and following conclusions were reached:

- Majority of the COPD patients were in the age group of 56-70 years, males, married, educated and currently not working.
- 55% patients were of GOLD stage 3 COPD, 45% were of GOLD stage 4 and average duration of COPD was 5-10 years.
- The history of smoking was present in 42% of the cases (current smokers).
- 83% of the patients were found to have psychiatric comorbidity.
- Out of 83% patients in whom psychiatric comorbidity was found, 54.2% belonged to grade 4 COPD and 45.8% belonged to grade 3 COPD (presence of psychiatric comorbidity in COPD patients was significantly related to increasing severity of the disease).
- The association of psychiatric comorbidity in patients is significantly related to duration of COPD: more the duration, more is the frequency of association.
- Substance abuse (non-alcohol) abuse/ dependence was most common in COPD patients (41%) followed by MDD/RDD (31%) and alcohol abuse/ dependence (16%), dysthymia (14%), GAD (10%) and panic disorder (8%).
- The QOL on all domains of WHOQOL-BREF was significantly lower for GOLD 4 COPD as compared to GOLD 3 stage.
- The QOL was associated with the age, education and gender of the patient and was relatively better in young, educated and female patients.
- QOL decreases significantly with the presence of psychiatric comorbidity.
- Out of 100 caregivers, most of them were males and in age group of 46-60 years.

- 59% caregivers were found to have psychiatric morbidity out of which alcohol abuse/dependence was the most common (23%) followed by substance abuse/ dependence (non-alcohol) (13%).
- The association of frequency of psychiatric comorbidity was more with GOLD 4 COPD caregiver than GOLD 3 COPD.
- QOL on all 4 domains of WHOQOL-BREF were lower for caregivers of grade 4 COPD than for grade 3 COPD.
- QOL was poorer in presence of psychiatric morbidity in the caregiver.
- QOL of both patients and caregivers declined on all 4 domains with increasing severity of the disease.
- All the domains of QOL on BREF are significantly related to very severe COPD both for patient and caregiver except for the social domain.
- COPD patients had poor QOL as compared to their caregivers regardless of the presence of the psychiatric comorbidity.

Hence, our study concludes that there is significant association of psychiatric co-morbidities in COPD patients and their caregivers. The frequency of this association increases with the increasing severity of the disease. The QOL further deteriorates in presence of psychiatric co-morbidities in patients and carers of severe and very severe COPD. The findings in our study, in Indian context, are concordant with the pre-existing literature of the west. This understanding and realization of association of mental health aspects with severity of COPD in patients and their caregivers is essential for early screening and timely psychiatric consultation which is the need of the hour in India. This should further guide the treatment protocols of COPD to focus not only on the physical health but also on the mental health to reduce the psychological distress and improve the QOL.

LIMITATIONS:

- Our study was conducted on a small sample of COPD patients which is not representative of the total COPD population. This limits the generalisation of the results on COPD patients.
- Our study included only severe and very severe forms of COPD patients. The mild and moderate cases were not taken into consideration. Hence, the comparison could not be done.
- The QOL was self-reported and subjective rather than objective.
- The premorbid personality traits and coping skills were not assessed in our study which could have confounded the results.

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Socio Demographic Proforma

PATIENT PROFILE S. NO.

NAME: AGE/SEX:

MRD NO:

OCCUPATION:

EDUCATION:

INCOME:

MARITAL STATUS:

DURATION OF COPD:

GRADE/ SEVERITY(DATE ; FEV1)

HISTORY OF SMOKING:

MONTHLY HOSPITAL EXPENSES:

ADDRESS:

CONTACT NO.:

PSYCHIATRIC CO-MORBIDITY IF ANY (ASSESSED BY M.I.N.I)

SCORE (WHOQOL BREF):

CAREGIVER PROFILE

NAME:

AGE/SEX:

RELATIONSHIP:

DURATION OF LIVING TOGETHER:

CONTACT NO.:

PSYCHIATRIC CO-MORBIDITY IF ANY(ASSESSED BY M.I.N.I)

SCORE (WHOQOL BREF):

Signature of Supervisor **Signature of Candidate**

Mini Neuro-Psychiatric Interview

Patient Name MRD No:-

MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV	ICD-10
A. MAJOR DEPRESIVE EPISODE	Current (past 2 weeks) Recurrent		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
MDE WITH MELANCHOLIC FEATURES	Current (2 weeks)		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
B. DYSTHYMIA	Current (Past 2 years)		300.4	F34.1
C. SUICIDALITY	Current (Past Month) Risk: Low Medium High			
D. MANIC EPISODE	Current Past		296.00-296.06	F30x-F31.9
HAYPOMANIC EPISODE	Current Past		296.80-296.89	F31.8-F31.9/F34.0
E. PANIC DISORDER	Current (Past Month) Lifetime		300.01/300.21	F40.01-F41.0
F. AGORAPHOBIA	Current		300.22	F40.00
G. SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)		300.23	F40.1
H. OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)		300.3	F42.8
I. POSTTRAUMATIC STRESS DISORDER Optional	Current (Past Month)		309.81	F43.1
J. ALCOHOL DEPENDENCE ALCOHOL ABUSE	Past 12 Months Past 12 Months		303.9 305.00	F10.2x F10.1
K. SUBSTANCE DEPENDENCE (Non-alcohol) SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months Past 12 Months		304.00-90/305.20-90 304.00-90/305.20-90	F11.1-F19.1 F11.1-F19.1
L. PSYCHOTIC DISORDERS	Lifetime Current		295.10-295.90/297.1/ 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29
MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime Current		296.24/296.34/296.4	F32.3/F33.3/ F30.2/f31.2/f31.5 F31.8/F31.9/F39
M. ANOREXIA NERVOSA	Current (Past 3 Months)		307.1	F50.0
N. BULIMIA NERVOSA	Current (Past 3 Months)		307.51	F50.2
ANOREXIA NERVOSA, BINGE EATING/ PURGING	Current		307.1	F50.0
O. GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)		300.02	F41.1
P. ANTISOCIAL PERSONALITY DISORDER Optional	Lifetime		301.7	F60.2

Signature of Supervisor **Signature of Candidate**

WHO Quality of Life BREF

Patient Proforma

Patient Name:- MRD No:-

	Equations for computing domain scores	Raw score	Transformed scores*	
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=	4-20	0-100
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

Care Giver Proforma

Caregiver Name:-

	Equations for computing domain scores	Raw score	Transformed scores*	
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=	4-20	0-100
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

Signature of Supervisor **Signature of Candidate**

Mini Neuro-Psychiatric Interview

Caregiver Name: Relation:

MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV	ICD-10
A. MAJOR DEPRESIVE EPISODE	Current (past 2 weeks) Recurrent		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
MDE WITH MELANCHOLIC FEATURES	Current (2 weeks)		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
B. DYSTHYMIA	Current (Past 2 years)		300.4	F34.1
C. SUICIDALITY	Current (Past Month) Risk: Low Medium High			
D. MANIC EPISODE	Current Past		296.00-296.06	F30x-F31.9
HAYPOMANIC EPISODE	Current Past		296.80-296.89	F31.8-F31.9/F34.0
E. PANIC DISORDER	Current (Past Month) Lifetime		300.01/300.21	F40.01-F41.0
F. AGORAPHOBIA	Current		300.22	F40.00
G. SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)		300.23	F40.1
H. OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)		300.3	F42.8
I. POSTTRAUMATIC STRESS DISORDER Optional	Current (Past Month)		309.81	F43.1
J. ALCOHOL DEPENDENCE ALCOHOL ABUSE	Past 12 Months Past 12 Months		303.9 305.00	F10.2x F10.1
K. SUBSTANCE DEPENDENCE (Non-alcohol) SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months Past 12 Months		304.00-90/305.20-90 304.00-90/305.20-90	F11.1-F19.1 F11.1-F19.1
L. PSYCHOTIC DISORDERS	Lifetime Current		295.10-295.90/297.1/ 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29
MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime Current		296.24/296.34/296.4	F32.3/F33.3/ F30.2/f31.2/f31.5 F31.8/F31.9/F39
M. ANOREXIA NERVOSA	Current (Past 3 Months)		307.1	F50.0
N. BULIMIA NERVOSA	Current (Past 3 Months)		307.51	F50.2
ANOREXIA NERVOSA, BINGE EATING/ PURGING	Current		307.1	F50.0
O. GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)		300.02	F41.1
P. ANTISOCIAL PERSONALITY DISORDER Optional	Lifetime		301.7	F60.2

Signature of Supervisor **Signature of Candidate**

KEY TO MASTER CHART

PATIENT

Age:

1- 25-35 YEARS

2- 36-45 YEARS

3- 46-55 YEARS

4- 56-70 YEARS

Gender:

1 MALE

2 FEMALE

3 OTHERS

Occupation:

1 PROFESSIONAL

2 SELF EMPLOYED / CLERICAL/SHOPKEEPER

3 SKILLED WORKER

4 SEMISKILLED WORKER

5 UNSKILLED WORKER

6 UNEMPLOYED/ HOMEMAKER/ RETIRED

Educational status:

1 PROFESSIONAL DEGREE

2 GRADUATE

3 DIPLOMA

4 HIGH SCHOOL

5 MIDDLE SCHOOL

6 PRIMARY SHOOL

7 ILLITERATE

Income:

PER MONTH:

1- LESS THAN 10000

2- 10000-20000

3- 20000-30000

4- 30000-40000

5- MORE THAN 40000

6- DEPENDENT

Marital Status

1- MARRIED

2- UNMARRIED/SINGLE

3- DIVORCED/SEPARATED/widow/widower

Duration of COPD:

1- LESS THAN 5 YEARS

2- 5-10 YEARS

3- 11-15 YEARS

4- 16-20 YEARS

5- MORE THAN 20 YEARS

Grade/severity:

1- GOLD 3/ SEVERE

2- GOLD 4/VERY SEVERE

History of smoking:

1-YES

2-NO

Monthly hospital expenses:

1- LESS THAN 3000 RUPEES

2- 3000-5000 RUPEES

3- 5000-7000 RUPEES

4- MORE THAN 7000 RUPEES

CAREGIVER

Age:

1 <18 years

2 18-30 years

3 31-45 years

4 46-60 years

5 >60 years

Gender:

1 MALE

2 FEMALE

3 OTHERS

Relationship:

1 FATHER

2 MOTHER

3 SPOUSE

4 SON / DAUGHTER

5 SON-IN-LAW / DAUGHTER-IN-LAW

6 SIBLING

7 OTHERS

Duration of living together:

1- <10 YEARS

2- 10-20 YEARS

3- 21-30 YEARS

4- 31-40 YEARS

5- 41-50 YEARS

6- >50 YEARS

Grade/severity:

1- GOLD 3/ SEVERE

2- GOLD 4/VERY SEVERE

S. no	name initials	age (years)	Gender	Occup	Educational status	Income	Marital Status	Duration of COPD	Grade/ Severity	History of Smoking	Monthly Hospital Expenses	Psychatric Morbidity	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/ dependence
1	BK	4	2	6	7	3	1	2	2	2	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
2	RC	4	1	3	4	4	1	3	2	1	2	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
3	CL	4	1	5	5	2	3	2	1	1	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
4	BS	4	1	1	1	4	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5	HK	4	2	3	5	3	1	2	1	2	4	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES
6	NK	3	1	3	5	2	1	2	2	2	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
7	JK	4	2	6	5	4	1	2	1	2	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
8	PV	3	1	1	1	5	1	2	1	2	3	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO
9	RJ	4	1	2	4	2	1	3	2	1	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
10	JK	4	2	6	5	6	1	4	2	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
11	GK	4	1	6	4	2	3	3	1	1	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
12	UR	4	2	6	4	6	1	2	1	2	3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
13	HI	4	1	4	6	2	1	2	2	1	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
14	MR	4	1	6	6	6	3	5	2	2	2	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO
15	ML	2	1	4	5	2	1	2	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
16	SPS	4	1	6	5	6	1	3	2	1	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
17	AK	4	1	2	5	3	1	2	1	1	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
18	KS	3	1	2	5	3	1	2	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
19	SL	4	1	4	5	2	1	2	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
20	CD	4	2	6	7	6	1	2	1	2	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
21	KS	4	1	2	5	5	1	2	1	2	1	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO
22	RK	3	1	2	3	4	1	2	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
23	AS	4	1	2	2	5	1	2	2	2	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
24	RD	3	1	1	2	5	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
25	NP	4	2	6	1	6	3	3	2	2	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
26	GS	4	1	2	5	2	1	3	2	1	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
27	BK	4	1	3	5	3	1	5	2	2	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
28	HK	4	2	6	5	6	3	4	2	2	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
29	S	3	1	2	4	4	1	2	2	1	4	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
30	RS	2	1	1	5	2	1	2	1	1	1	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
31	CR	4	1	6	4	6	1	5	2	1	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
32	CK	4	2	6	5	6	1	2	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
33	BS	3	1	3	5	3	1	1	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
34	K	3	2	6	5	6	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
35	DS	4	1	3	6	3	1	3	2	2	4	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
36	AS	3	1	1	2	5	1	2	1	1	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
37	NS	4	1	6	4	6	3	2	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES
38	HS	2	1	4	5	4	1	2	2	1	4	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
39	SK	2	1	1	4	4	1	2	1	2	1	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES
40	ML	4	1	3	5	2	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
41	JKB	4	1	6	4	6	1	3	2	2	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES
42	DR	4	1	1	4	4	1	3	2	1	3	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO

S. no	name initials	substance abuse / dependence (non alcohol)	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	WHO-BREF_ Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
1	BK	NO	NO	NO	NO	NO	NO	15	9	31	16	11	44	8	11	44	24	12	50
2	RC	YES	NO	NO	NO	NO	NO	15	9	31	15	10	38	8	11	44	23	12	50
3	CL	YES	NO	NO	NO	NO	NO	21	12	50	20	13	56	9	12	50	20	10	38
4	BS	NO	NO	NO	NO	NO	NO	21	12	50	22	15	69	11	15	69	29	15	69
5	HK	NO	NO	NO	NO	NO	NO	16	9	31	18	12	50	9	12	50	24	12	50
6	NK	NO	NO	NO	NO	NO	NO	16	9	31	13	9	31	8	11	44	24	12	50
7	JK	NO	NO	NO	NO	YES	NO	17	10	38	16	11	44	8	11	44	24	12	50
8	PV	NO	NO	NO	NO	NO	NO	15	9	31	14	9	31	8	11	44	25	13	56
9	RJ	YES	NO	NO	NO	NO	NO	12	7	19	12	8	25	6	8	25	20	10	38
10	JK	NO	NO	NO	NO	NO	NO	15	9	31	16	11	44	8	11	44	24	12	50
11	GK	YES	NO	NO	NO	NO	NO	19	11	44	16	11	44	8	11	44	28	14	63
12	UR	NO	NO	NO	NO	NO	NO	21	12	50	17	11	44	9	12	50	23	12	50
13	HI	YES	NO	NO	NO	NO	NO	20	11	44	15	10	38	9	12	50	20	10	38
14	MR	NO	NO	NO	NO	NO	NO	14	8	25	12	8	25	6	8	25	19	10	38
15	ML	NO	NO	NO	NO	NO	NO	23	13	56	17	11	44	11	15	69	27	14	63
16	SPS	YES	NO	NO	NO	YES	NO	24	14	63	21	14	63	11	15	69	25	13	56
17	AK	YES	NO	NO	NO	NO	NO	23	15	56	19	13	56	9	12	50	25	13	56
18	KS	NO	NO	NO	NO	NO	NO	23	13	56	15	10	38	9	12	50	20	10	38
19	SL	NO	NO	NO	NO	NO	NO	19	11	44	15	10	38	8	11	44	21	11	44
20	CD	NO	NO	NO	NO	NO	NO	19	11	44	15	10	38	7	9	31	20	10	38
21	KS	NO	NO	NO	NO	NO	NO	17	10	38	14	9	31	7	9	31	23	12	50
22	RK	NO	NO	NO	NO	NO	NO	27	15	69	21	14	63	10	13	56	29	15	69
23	AS	NO	NO	NO	NO	NO	NO	17	10	38	15	10	38	7	9	31	27	14	63
24	RD	NO	NO	NO	NO	YES	NO	27	15	69	18	12	50	11	15	69	29	15	69
25	NP	NO	NO	NO	NO	NO	NO	21	12	50	15	10	38	8	11	44	21	11	44
26	GS	YES	NO	NO	NO	NO	NO	17	10	38	14	9	31	7	9	31	21	11	44
27	BK	YES	NO	NO	NO	NO	NO	17	10	38	13	9	31	8	11	44	22	11	44
28	HK	NO	NO	NO	NO	NO	NO	18	10	38	15	10	38	7	9	31	25	13	56
29	S	YES	NO	NO	NO	YES	NO	20	11	44	15	10	38	8	11	44	23	12	50
30	RS	YES	NO	NO	NO	NO	NO	22	13	56	15	10	38	9	12	50	22	11	44
31	CR	YES	NO	NO	NO	NO	NO	18	10	38	15	10	38	7	9	31	27	14	63
32	CK	NO	NO	NO	NO	NO	NO	20	11	44	14	9	31	9	12	50	23	12	50
33	BS	NO	NO	NO	NO	NO	NO	26	15	69	20	13	56	10	13	56	27	14	63
34	K	NO	NO	NO	NO	NO	NO	26	15	69	21	14	63	12	16	75	29	15	69
35	DS	NO	NO	NO	NO	NO	NO	26	15	69	17	11	44	9	12	50	23	12	50
36	AS	YES	NO	NO	NO	NO	NO	25	14	63	21	14	63	10	13	56	28	14	63
37	NS	NO	NO	NO	NO	NO	NO	18	10	38	14	9	31	6	8	25	22	11	44
38	HS	YES	NO	NO	NO	NO	NO	18	10	38	16	11	44	9	12	50	25	13	56
39	SK	NO	NO	NO	NO	NO	NO	18	10	38	16	11	44	9	12	50	22	11	44
40	ML	YES	NO	NO	NO	NO	NO	16	9	31	16	11	44	7	9	31	18	9	31
41	JKB	NO	NO	NO	NO	NO	NO	17	10	38	15	10	38	9	12	50	22	11	44
42	DR	YES	NO	NO	NO	NO	NO	19	11	44	16	11	44	8	11	44	21	11	44

S. no	name initials	age (years)	Gender	Occup	Educational status	Income	Marital Status	Duration of COPD	Grade/ Severity	History of Smoking	Monthly Hospital Expenses	Psychatric Morbidity	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/ dependence
43	HS	4	1	6	5	6	1	5	2	1	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
44	JS	2	1	2	4	2	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
45	HS	4	1	6	3	4	1	2	1	2	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
46	DS	3	1	2	5	5	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
47	PK	2	1	3	5	2	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
48	RBS	2	1	3	4	4	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
49	HK	4	2	6	6	6	3	4	2	2	1	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
50	RK	2	2	6	5	6	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
51	RD	3	1	1	2	5	1	2	2	1	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
52	OP	4	1	2	4	4	1	2	1	2	3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
53	GK	4	1	6	5	6	3	3	1	1	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
54	BS	4	1	1	5	6	1	4	1	2	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
55	GK	3	2	6	5	6	1	2	1	2	1	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
56	OP	3	1	4	5	2	1	2	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
57	ML	2	1	4	5	2	1	2	1	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
58	AK	3	2	6	4	6	1	2	1	2	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
59	GS	4	1	2	5	2	1	3	2	1	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
60	GS	4	1	3	5	3	1	2	1	2	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
61	SL	4	1	5	5	2	1	3	1	2	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
62	MR	4	1	4	6	6	3	5	2	1	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
63	GS	4	1	1	1	5	1	2	1	1	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
64	SS	2	1	3	4	4	1	2	2	1	2	YES	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
65	VB	4	2	6	3	6	1	3	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
66	U	4	2	6	4	6	1	3	2	2	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
67	AS	3	1	1	2	5	1	3	2	1	3	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
68	BS	4	1	2	3	4	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
69	RC	4	1	6	4	6	3	5	2	2	4	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO
70	HK	3	2	6	4	6	1	2	1	2	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
71	B	4	1	2	4	4	1	5	2	1	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
72	YB	2	1	6	4	6	3	2	1	1	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
73	NS	4	1	6	4	6	3	2	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES
74	NS	2	1	4	7	2	1	2	2	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
75	GB	3	2	2	4	5	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
76	AS	3	1	1	2	5	1	3	2	1	3	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
77	GS	2	1	3	4	4	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
78	HS	4	1	6	5	6	1	5	2	1	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
79	JS	2	1	2	4	2	1	2	1	1	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
80	BS	4	1	2	4	6	1	4	1	2	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
81	DR	3	1	2	4	3	1	3	2	1	3	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
82	MR	4	1	4	6	6	3	5	2	1	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
83	RJ	4	1	2	4	2	1	3	2	1	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
84	HK	4	2	6	6	6	3	4	2	2	3	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO

S. no	name initials	substance abuse / dependence (non alcohol)	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	WHO-BREF_ Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
43	HS	YES	NO	NO	NO	NO	NO	19	11	44	19	13	56	10	13	56	23	12	50
44	JS	YES	NO	NO	NO	NO	NO	25	14	63	22	15	69	12	16	75	28	14	63
45	HS	NO	NO	NO	NO	NO	NO	23	13	56	20	13	56	11	15	69	27	14	63
46	DS	YES	NO	NO	NO	NO	NO	23	13	56	18	12	50	9	12	50	21	11	44
47	PK	YES	NO	NO	NO	NO	NO	19	11	44	12	8	25	6	8	25	22	11	44
48	RBS	NO	NO	NO	NO	NO	NO	23	13	56	18	12	50	10	13	56	23	12	50
49	HK	NO	NO	NO	NO	NO	NO	16	9	31	16	11	44	9	12	50	22	11	44
50	RK	NO	NO	NO	NO	NO	NO	21	12	50	20	13	56	12	16	75	28	14	63
51	RD	NO	NO	NO	NO	YES	NO	16	9	31	14	9	31	8	11	44	23	12	50
52	OP	NO	NO	NO	NO	NO	NO	25	14	63	20	13	56	10	13	56	29	15	69
53	GK	YES	NO	NO	NO	NO	NO	18	10	38	17	11	44	9	12	50	21	11	44
54	BS	NO	NO	NO	NO	NO	NO	19	11	44	12	8	25	6	8	25	21	11	44
55	GK	NO	NO	NO	NO	NO	NO	24	14	63	20	13	56	10	13	56	28	14	63
56	OP	NO	NO	NO	NO	NO	NO	17	10	38	15	10	38	7	9	31	16	8	25
57	ML	NO	NO	NO	NO	NO	NO	23	13	56	17	11	44	11	15	69	27	14	63
58	AK	NO	NO	NO	NO	NO	NO	21	12	50	15	10	38	8	11	44	20	10	38
59	GS	YES	NO	NO	NO	NO	NO	17	10	38	14	9	31	7	9	31	21	11	44
60	GS	NO	NO	NO	NO	YES	NO	25	14	63	21	14	63	9	12	50	25	13	56
61	SL	YES	NO	NO	NO	NO	NO	23	13	56	19	13	56	9	12	50	22	11	44
62	MR	YES	NO	NO	NO	NO	NO	17	10	38	15	10	38	7	9	31	22	11	44
63	GS	YES	NO	NO	NO	NO	NO	21	12	50	19	13	56	9	12	50	24	12	50
64	SS	YES	NO	NO	NO	NO	NO	14	8	25	16	11	44	9	12	50	24	12	50
65	VB	NO	NO	NO	NO	NO	NO	21	12	50	15	10	38	11	15	69	28	14	63
66	U	NO	NO	NO	NO	YES	NO	14	8	25	15	10	38	7	9	31	24	12	50
67	AS	YES	NO	NO	NO	NO	NO	17	10	38	15	10	38	9	12	50	28	14	63
68	BS	NO	NO	NO	NO	NO	NO	21	12	50	18	12	50	9	12	50	24	12	50
69	RC	NO	NO	NO	NO	NO	NO	16	9	31	16	11	44	9	12	50	22	11	44
70	HK	NO	NO	NO	NO	NO	NO	22	13	56	18	12	50	11	15	69	27	14	63
71	B	YES	NO	NO	NO	NO	NO	14	8	25	14	9	31	7	9	31	24	12	50
72	YB	NO	YES	NO	NO	NO	NO	23	13	56	15	10	38	11	15	69	25	13	56
73	NS	NO	NO	NO	NO	NO	NO	18	10	38	14	9	31	6	8	25	22	11	44
74	NS	YES	NO	NO	NO	NO	NO	16	9	31	14	9	31	8	11	44	24	12	50
75	GB	NO	NO	NO	NO	NO	NO	24	14	63	20	13	56	12	16	75	27	14	63
76	AS	YES	NO	NO	NO	NO	NO	17	10	38	15	10	38	9	12	50	28	14	63
77	GS	YES	NO	NO	NO	NO	NO	25	14	63	21	14	63	10	13	56	25	13	56
78	HS	YES	NO	NO	NO	NO	NO	19	11	44	19	13	56	10	13	56	23	12	50
79	JS	YES	NO	NO	NO	NO	NO	25	14	63	22	15	69	12	16	75	28	14	63
80	BS	NO	NO	NO	NO	NO	NO	22	13	56	20	13	56	10	13	56	24	12	50
81	DR	YES	NO	NO	NO	NO	NO	18	10	38	15	10	38	8	11	44	21	11	44
82	MR	YES	NO	NO	NO	NO	NO	17	10	38	15	10	38	8	11	44	22	11	44
83	RJ	YES	NO	NO	NO	NO	NO	12	7	19	12	8	25	6	8	25	20	10	38
84	HK	NO	NO	NO	NO	NO	NO	19	11	44	16	11	44	8	11	44	20	10	38

S. no	name initials	age (years)	Gender	Occup	Educational status	Income	Marital Status	Duration of COPD	Grade/ Severity	History of Smoking	Monthly Hospital Expenses	Psychatric Morbidity	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/ dependence
85	SK	4	2	6	6	6	3	2	1	2	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
86	PS	4	1	4	4	6	3	2	2	2	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
87	BK	4	2	6	4	6	1	3	1	2	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
88	AK	4	2	6	6	6	3	5	2	2	3	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
89	RC	3	1	2	4	4	1	2	2	1	3	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
90	BS	4	1	6	2	5	1	3	2	1	3	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES
91	DS	3	1	4	4	5	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
92	LS	4	1	3	4	5	1	3	1	1	3	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
93	JK	4	2	6	4	6	1	3	2	2	3	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
94	VG	3	2	6	4	6	1	2	2	2	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
95	OP	4	1	2	4	4	1	2	1	2	3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
96	HS	4	1	6	3	4	1	2	1	2	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
97	HS	2	1	4	5	4	1	2	2	1	4	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
98	K	3	2	6	5	6	1	2	1	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
99	S	3	1	2	4	4	1	2	2	1	4	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
100	AS	4	1	2	2	5	1	2	2	2	4	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO

S. no	name initials	substance abuse / dependence (non alcohol)	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	WHO-BREF_ Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
85	SK	NO	NO	NO	NO	NO	NO	24	14	63	19	13	56	9	12	50	24	12	50
86	PS	NO	NO	NO	NO	YES	NO	17	10	38	15	10	38	9	12	50	20	10	38
87	BK	NO	NO	NO	NO	YES	NO	26	15	69	20	13	56	10	13	56	27	14	63
88	AK	NO	NO	NO	NO	NO	NO	17	10	38	15	10	38	8	11	44	21	11	44
89	RC	YES	NO	NO	NO	NO	NO	16	9	31	15	10	38	6	8	25	23	12	50
90	BS	YES	NO	NO	NO	NO	NO	19	11	44	15	10	38	7	9	31	25	13	56
91	DS	NO	NO	NO	NO	NO	NO	24	14	63	22	15	69	12	16	75	29	15	69
92	LS	YES	NO	NO	NO	NO	NO	24	14	63	16	11	44	12	16	75	23	12	50
93	JK	NO	NO	NO	NO	NO	NO	17	10	38	16	11	44	7	9	31	21	11	44
94	VG	NO	NO	NO	NO	NO	NO	19	11	44	15	10	38	8	11	44	27	14	63
95	OP	NO	NO	NO	NO	NO	NO	25	14	63	20	13	56	10	13	56	29	15	69
96	HS	NO	NO	NO	NO	NO	NO	23	13	56	20	13	56	11	15	69	27	14	63
97	HS	YES	NO	NO	NO	NO	NO	18	10	38	16	11	44	9	12	50	25	13	56
98	K	NO	NO	NO	NO	NO	NO	26	15	69	21	14	63	12	16	75	29	15	69
99	S	YES	NO	NO	NO	YES	NO	20	11	44	15	10	38	8	11	44	23	12	50
100	AS	NO	NO	NO	NO	NO	NO	17	10	38	15	10	38	7	9	31	27	14	63

S. no	name initials	age (years)	Gender	Relationship	Duration of living together (YEARS)	Grade/ Severity	Psychatric disorders	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/dependence	substance abuse/dependence (non alcohol)
1	KS	5	1	3	5	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2	K	5	2	3	5	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3	RR	3	2	5	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4	S	4	2	3	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5	VK	3	1	4	5	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
6	V	4	2	3	3	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
7	SS	3	2	5	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
8	SV	5	1	1	6	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
9	NR	5	1	1	6	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
10	RS	3	1	4	4	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
11	P	2	2	4	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
12	SK	4	1	3	3	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
13	B	4	2	3	4	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
14	SD	4	1	4	5	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
15	S	3	2	3	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
16	SS	3	1	4	4	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
17	PS	3	1	4	4	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
18	JS	2	1	4	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
19	DR	3	1	4	4	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
20	P	2	1	4	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
21	CS	2	1	4	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
22	P	4	2	3	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
23	JS	2	1	4	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
24	DD	4	2	3	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
25	D	3	1	5	1	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
26	DK	5	2	3	3	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
27	S	5	2	3	4	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
28	MK	3	2	5	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
29	SK	4	2	3	3	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
30	AB	3	2	3	2	1	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
31	S	3	2	5	1	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
32	DS	5	1	3	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
33	A	2	1	4	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
34	SS	4	1	3	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
35	NK	3	2	5	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
36	JS	2	1	4	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
37	JS	4	1	4	6	1	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO

S. no	name initials	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
1	KS	NO	NO	NO	YES	NO	16	9	31	21	14	63	12	16	75	28	14	63
2	K	NO	NO	NO	NO	NO	16	9	31	21	14	63	12	16	75	27	14	63
3	RR	NO	NO	NO	NO	NO	24	14	63	24	16	75	12	16	75	29	15	69
4	S	NO	NO	NO	NO	NO	19	11	44	23	15	69	11	15	69	32	16	75
5	VK	NO	NO	NO	NO	NO	16	9	31	21	14	63	12	16	75	24	12	50
6	V	NO	NO	NO	NO	NO	18	10	38	21	14	63	12	16	75	31	16	75
7	SS	NO	NO	NO	NO	NO	22	13	56	21	14	63	12	16	75	28	14	63
8	SV	NO	NO	NO	NO	NO	16	9	31	21	14	63	12	16	75	28	14	63
9	NR	NO	NO	NO	NO	NO	16	9	31	17	11	44	11	15	69	22	11	44
10	RS	NO	NO	NO	YES	NO	20	11	44	21	14	63	12	16	75	27	14	63
11	P	NO	NO	NO	NO	NO	18	10	38	22	15	69	12	16	75	30	15	69
12	SK	NO	NO	NO	NO	NO	21	12	50	16	11	44	10	13	56	23	12	50
13	B	NO	NO	NO	NO	NO	25	14	63	17	11	44	9	12	50	22	11	44
14	SD	NO	NO	NO	NO	NO	23	13	56	18	12	50	11	15	69	28	14	63
15	S	NO	NO	NO	NO	NO	25	14	63	19	13	56	12	16	75	28	14	63
16	SS	NO	NO	NO	NO	NO	28	16	75	21	14	63	12	16	75	28	14	63
17	PS	NO	NO	NO	NO	NO	24	14	63	23	15	69	12	16	75	29	15	69
18	JS	NO	NO	NO	NO	NO	24	14	63	22	15	69	11	15	69	28	14	63
19	DR	NO	NO	NO	NO	NO	22	13	56	20	13	56	12	16	75	26	13	56
20	P	NO	NO	NO	NO	NO	27	15	69	21	14	63	11	15	69	27	14	63
21	CS	NO	NO	NO	NO	NO	26	15	69	20	13	56	12	16	75	26	13	56
22	P	NO	NO	NO	NO	NO	28	16	75	21	14	63	10	13	56	29	15	69
23	JS	NO	NO	NO	NO	NO	26	15	69	22	15	69	10	13	56	29	15	69
24	DD	NO	NO	NO	NO	NO	28	16	75	24	16	75	12	16	75	24	12	50
25	D	NO	NO	NO	NO	NO	28	16	75	22	15	69	12	16	75	30	15	69
26	DK	NO	NO	NO	NO	NO	18	10	38	16	11	44	9	12	50	23	12	50
27	S	NO	NO	NO	NO	NO	21	12	50	17	11	44	9	12	50	23	12	50
28	MK	NO	NO	NO	NO	NO	28	16	75	22	15	69	12	16	75	30	15	69
29	SK	NO	NO	NO	NO	NO	25	14	63	15	10	38	9	12	50	27	14	63
30	AB	NO	NO	NO	NO	NO	23	13	56	20	13	56	10	13	56	26	13	56
31	S	NO	NO	NO	NO	NO	25	14	63	21	14	63	10	13	56	28	14	63
32	DS	NO	NO	NO	NO	NO	23	13	56	15	10	38	11	15	69	24	12	50
33	A	NO	NO	NO	NO	NO	26	15	69	26	17	81	12	16	75	30	15	69
34	SS	NO	NO	NO	NO	NO	28	16	75	22	15	69	12	16	75	30	15	69
35	NK	NO	NO	NO	NO	NO	27	15	69	21	14	63	12	16	75	29	15	69
36	JS	NO	NO	NO	NO	NO	24	14	63	20	13	56	12	16	75	29	15	69
37	JS	NO	NO	NO	NO	NO	24	14	63	19	13	56	10	13	56	26	13	56

S. no	name initials	age (years)	Gender	Relationship	Duration of living together (YEARS)	Grade/ Severity	Psychatric disorders	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/dependence	substance abuse/dependence (non alcohol)
38	VK	3	2	3	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
39	M	3	1	6	4	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
40	NL	4	1	6	6	1	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
41	A	4	1	4	5	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
42	HS	2	1	4	3	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
43	AK	4	2	5	3	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
44	SK	4	2	2	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
45	HK	4	2	3	4	1	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
46	PK	3	2	3	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
47	JK	5	1	1	4	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
48	MK	5	2	2	5	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
49	MK	4	2	5	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
50	HS	3	1	3	2	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
51	DD	4	2	3	3	2	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
52	R	3	1	4	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
53	P	2	2	4	3	1	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
54	N	3	2	5	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
55	RK	4	1	3	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
56	R	2	1	4	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
57	S	3	2	3	2	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
58	KS	4	1	3	3	1	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	YES	NO
59	DK	4	2	3	3	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
60	GS	2	1	4	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
61	DR	3	1	4	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
62	SD	4	1	4	5	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
63	BK	4	2	3	4	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
64	TD	5	2	2	4	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
65	GB	5	1	3	5	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
66	DP	5	1	3	5	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
67	NK	4	2	3	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
68	GS	2	1	4	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
69	S	3	2	5	1	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
70	HS	4	1	3	3	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
71	VK	4	1	4	6	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
72	KKB	5	1	1	5	1	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
73	JS	4	1	4	6	1	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
74	LK	3	2	3	3	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO

S. no	name initials	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
38	VK	NO	NO	NO	NO	NO	26	15	69	22	15	69	12	16	75	29	15	69
39	M	NO	NO	NO	NO	NO	24	14	63	21	14	63	10	13	56	27	14	63
40	NL	NO	NO	NO	NO	NO	21	12	50	16	11	44	10	13	56	21	11	44
41	A	NO	NO	NO	YES	NO	25	14	63	21	14	63	11	15	69	22	11	44
42	HS	NO	NO	NO	NO	NO	24	14	63	20	13	56	12	16	75	21	11	44
43	AK	NO	NO	NO	NO	NO	26	15	69	22	15	69	12	16	75	28	14	63
44	SK	NO	NO	NO	NO	NO	23	13	56	20	13	56	11	15	69	25	13	56
45	HK	NO	NO	NO	NO	NO	28	16	75	21	14	63	12	16	75	28	14	63
46	PK	NO	NO	NO	NO	NO	26	15	69	22	15	69	11	15	69	27	14	63
47	JK	NO	NO	NO	NO	NO	19	11	44	16	11	44	7	9	31	21	11	44
48	MK	NO	NO	NO	NO	NO	24	14	63	16	11	44	10	13	56	22	11	44
49	MK	NO	NO	NO	NO	NO	26	15	69	21	14	63	10	13	56	29	15	69
50	HS	NO	NO	NO	NO	NO	24	14	63	20	13	56	11	15	69	29	15	69
51	DD	NO	NO	NO	NO	NO	27	15	69	19	13	56	9	12	50	24	12	50
52	R	NO	NO	NO	NO	NO	26	15	69	21	14	63	12	16	75	30	15	69
53	P	NO	NO	NO	NO	NO	25	14	63	22	15	69	10	13	56	25	13	56
54	N	NO	NO	NO	NO	NO	27	15	69	21	14	63	11	15	69	28	14	63
55	RK	NO	NO	NO	NO	NO	24	14	63	18	12	50	11	15	69	28	14	63
56	R	NO	NO	NO	NO	NO	29	17	81	22	15	69	12	16	75	19	10	38
57	S	NO	NO	NO	NO	NO	25	14	63	19	13	56	12	16	75	28	14	63
58	KS	NO	NO	NO	NO	NO	20	11	44	18	12	50	9	12	50	21	11	44
59	DK	NO	NO	NO	NO	NO	18	10	38	16	11	44	9	12	50	23	12	50
60	GS	NO	NO	NO	NO	NO	25	14	63	23	15	69	12	16	75	28	14	63
61	DR	NO	NO	NO	NO	NO	29	17	81	23	15	69	11	15	69	26	13	56
62	SD	NO	NO	NO	NO	NO	24	14	63	20	13	56	11	15	69	26	13	56
63	BK	NO	NO	NO	YES	NO	23	13	56	22	15	69	12	16	75	30	15	69
64	TD	NO	NO	NO	NO	NO	23	13	56	14	9	31	8	11	44	23	12	50
65	GB	NO	NO	NO	NO	NO	21	12	50	18	12	50	9	12	50	25	13	56
66	DP	NO	NO	NO	NO	NO	23	13	56	15	10	38	9	12	50	26	13	56
67	NK	NO	NO	NO	YES	NO	26	15	69	20	13	56	10	13	56	29	15	69
68	GS	NO	NO	NO	NO	NO	26	15	69	20	13	56	12	16	75	28	14	63
69	S	NO	NO	NO	NO	NO	24	14	63	20	13	56	9	12	50	28	14	63
70	HS	NO	NO	NO	NO	NO	25	14	63	21	14	63	11	15	69	28	14	63
71	VK	NO	NO	NO	NO	NO	23	13	56	18	12	50	10	13	56	22	11	44
72	KKB	NO	NO	NO	NO	NO	25	14	63	21	14	63	11	15	69	27	14	63
73	JS	NO	NO	NO	NO	NO	24	14	63	19	13	56	10	13	56	26	13	56
74	LK	NO	NO	NO	NO	NO	24	14	63	21	14	63	12	16	75	26	13	56

S. no	name initials	age (years)	Gender	Relationship	Duration of living together (YEARS)	Grade/ Severity	Psychatric disorders	MINI_major depressive disorder/ recurrent depressive disorder	dysthymia	sucidality	manic episode	panic attack/ DISORDER	agoraphobia	social phobia	obsessive compulsive disorder	post traumatic stress disorder	alcohol abuse/dependence	substance abuse/dependence (non alcohol)
75	R	4	1	3	3	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
76	NK	4	2	3	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
77	BK	3	2	3	2	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
78	AK	4	2	5	3	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
79	SK	4	2	2	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
80	N	5	2	3	5	1	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
81	HS	2	1	4	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
82	SD	4	1	4	5	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
83	NR	4	1	1	4	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
84	MK	4	2	5	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
85	SS	3	1	4	5	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
86	JS	4	1	4	5	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
87	CS	5	1	3	5	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
88	AK	2	2	5	1	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
89	SC	3	1	6	5	2	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO
90	DK	4	2	3	4	2	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
91	PK	3	2	3	2	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
92	BS	2	1	4	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
93	RS	3	1	4	4	2	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO
94	AG	4	1	3	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
95	R	3	1	4	4	1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
96	HK	4	2	3	4	1	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
97	VK	3	2	3	2	2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
98	SS	4	1	3	3	1	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
99	SK	4	2	3	3	2	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
100	JS	2	1	4	3	2	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES

S. no	name initials	psychotic disorder	Anorexia nervosa	Bulimia nervosa	generalised anxiety disorder	antisocial personality	Domain 1 raw score	Domain 1 transformed score (4-20)	Domain 1 transformed score (0-100)	Domain 2 score	Domain 2 transformed score (4-20)	Domain 2 transformed score (0-100)	Domain 3 score	Domain 3 transformed score (4-20)	Domain 3 transformed score (0-100)	Domain 4 score	Domain 4 transformed score (4-20)	Domain 4 transformed score (0-100)
75	R	NO	NO	NO	NO	NO	26	15	69	23	15	69	12	16	75	28	14	63
76	NK	NO	NO	NO	YES	NO	26	15	69	20	13	56	10	13	56	29	15	69
77	BK	NO	NO	NO	YES	NO	26	15	69	22	15	69	10	13	56	27	14	63
78	AK	NO	NO	NO	NO	NO	26	15	69	22	15	69	12	16	75	28	14	63
79	SK	NO	NO	NO	NO	NO	23	13	56	20	13	56	11	15	69	25	13	56
80	N	NO	NO	NO	NO	NO	26	15	69	19	13	56	10	13	56	22	11	44
81	HS	NO	NO	NO	NO	NO	25	14	63	18	12	50	11	15	69	28	14	63
82	SD	NO	NO	NO	YES	NO	25	14	63	20	13	56	11	15	69	28	14	63
83	NR	NO	NO	NO	NO	NO	16	9	31	17	11	44	11	15	69	22	11	44
84	MK	NO	NO	NO	NO	NO	25	14	63	21	14	63	12	16	75	27	14	63
85	SS	NO	NO	NO	NO	NO	26	15	69	20	13	56	12	16	75	27	14	63
86	JS	NO	NO	NO	NO	NO	25	14	63	16	11	44	11	15	69	26	13	56
87	CS	NO	NO	NO	NO	NO	26	15	69	22	15	69	12	16	75	27	14	63
88	AK	NO	NO	NO	NO	NO	24	14	63	20	13	56	9	12	50	27	14	63
89	SC	NO	NO	NO	NO	NO	26	15	69	16	11	44	11	15	69	27	14	63
90	DK	NO	NO	NO	NO	NO	25	14	63	20	13	56	12	16	75	27	14	63
91	PK	NO	NO	NO	YES	NO	26	15	69	18	12	50	11	15	69	29	15	69
92	BS	NO	NO	NO	NO	NO	25	14	63	21	14	63	12	16	75	29	15	69
93	RS	NO	NO	NO	NO	NO	25	14	63	17	11	44	11	15	69	27	14	63
94	AG	NO	NO	NO	YES	NO	26	15	69	21	14	63	12	16	75	28	14	63
95	R	NO	NO	NO	NO	NO	26	15	69	21	14	63	12	16	75	30	15	69
96	HK	NO	NO	NO	NO	NO	28	16	75	21	14	63	12	16	75	28	14	63
97	VK	NO	NO	NO	NO	NO	26	15	69	22	15	69	12	16	75	29	15	69
98	SS	NO	NO	NO	NO	NO	28	16	75	22	15	69	12	16	75	30	15	69
99	SK	NO	NO	NO	NO	NO	25	14	63	15	10	38	9	12	50	27	14	63
100	JS	NO	NO	NO	NO	NO	26	15	69	22	15	69	10	13	56	29	15	69

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Date 9/9/19

The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.05.2019 has approved the plan of thesis of **Jasleen Kaur Bhalla**, a student of your college for **MD Psychiatry** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

Prevalence of psychiatric co-morbidities and the impact on quality of life in copd patients and their caregivers

Supervisor
Dr. Rupesh Chaudhary
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Co-Supervisor
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The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

SP Singh
Dr, S P Singh MS(Oph)
Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*
2. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

Doctor of Medicine
in

PSYCHIATRY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES
FARIDKOT

NOVEMBER, 2018 **DR. JASLEEN KAUR BHALLA**

DEPARTMENT OF PSYCHIATRY
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS
For the degree of	M.D PSYCHIATRY
Name of the candidate	Dr Jasleen Kaur Bhalla
Supervisor	Dr Rupesh Chaudhary, Professor, Department of Psychiatry
Co-supervisor(s)	Dr Sandeep Chhabra, Associate Professor, Department of Medicine Dr Anil Kumar Kashyap, Associate Professor, Department of Pulmonary Medicine
Institution	Dayanand Medical College & Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction:Chronic obstructive pulmonary disease (COPD) is characterized by persistent airflow limitation that is usually progressive. Psychiatric disorders usually co-exist with such chronic medical illnesses but they often remain undiagnosed. The interplay of demographic characteristics, clinical findings, disease severity and mental health of not only the patients but also their caregivers will determine their own quality of life as well as their influence on each other.

Aims of Study: To assess the prevalence of psychiatric co-morbidities and it the impact on the quality of life in COPD patients and their caregivers. The association will be correlated to the severity of COPD (based on Global Initiative against Obstructive Lung Disease (GOLD) guidelines 2018).

Material & Methods: This hospital based, cross-sectional study will be conducted in Dayanand Medical College & Hospital, Ludhiana. A total of 100 GOLD- 3 or 4 COPD patients and their caregivers will be included in the study. Psychiatric co-morbidities will be assessed using the Mini International Neuropsychiatric Interview questionnaire and the quality of life will be assessed by WHO-Quality of Life Assessment – BREF scale.

Clinical Significance:

Psychiatric disorders are usually under-diagnosed in patients of medical illness and these contribute to the quality of life of the patients and their caregivers and moreover, there is paucity of available data on it in Indian population.

Keywords: COPD, psychiatric disorders, quality of life, caregivers

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS"** exist in the Department of Psychiatry, DMC&H, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate himself under our supervision and guidance.

Supervisor

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Place : Ludhiana

Date : 26/11/18

APPROVAL PROFORMA
BY
RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

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Department	Psychiatry
Topic of Thesis	PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS
Likely date of appearing in PG examination	May – June 2021
Date of enrollment	10th May, 2018
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Research Committee

Approved : Yes / ~~No~~
Chairperson
Ethics Committee

Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

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2	NAME OF THE INSTITUTE	Dayanand Medical College and Hospital, Ludhiana
3	COURSE OF STUDY AND SUBJECT	MD Psychiatry
4	DATE OF ADMISSION OF COURSE	10-05-2018
5	TITLE OF THE TOPIC	PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Chronic obstructive pulmonary disease (COPD), a common medical disorder characterized by persistent airflow limitation that usually has a relapsing- remitting and progressive type of course. COPD can cause coughing that produces large amounts of a slimy substance called mucus, wheezing and shortness of breath. Cigarette smoking is the most common factor in etipathogenesis of COPD. Most people who have COPD smoke or used to smoke. However, up to 25 percent of people with COPD never smoked.[1] Long-term exposure to other lung irritants—such as air pollution, chemical fumes, or dusts—also may contribute to COPD. A rare genetic condition called alpha-1 antitrypsin deficiency can also cause the disease.

The spirometric criterion for airflow limitation remains a post-bronchodilator fixed ratio of FEV1/FVC <0.70. [2]

Common co-morbidities include heart diseases, skeletal muscle dysfunction, metabolic syndrome, osteoporosis, depression, anxiety and lung cancer. The existence of COPD may actually increase the risk for other diseases; this is particularly striking for COPD and lung cancer.[3,4]Whether this association is due to common risk factors (e.g., smoking), involvement of susceptibility genes, or impaired clearance of carcinogens is not clear.

Psychiatric disorders like anxiety, depression and substance abuse usually co-exist with such chronic medical illnesses but they often remain undiagnosed. They contribute significantly to the morbidity in these patients and their caregivers and also affect their quality of life.[5]

The mental health of the caregiver also plays pivotal role in overall prognosis and outcome of the COPD patients. The interplay of demographic characteristics, clinical findings, disease severity and mental health of not only the patients but also their caregivers will determine their own quality of life as well as their influence on each other.[6]

This study will aim to find the prevalence and association of psychiatric co-morbidities in COPD patients and their caregivers and their implications on the quality of life of each other. These factors which are mutually interlinked and are associated will be studied in view of the disease severity as well (based on Global Initiative against Obstructive Lung disease Guidelines, 2018).[7] The severity will be assessed by spirometric evaluation of the ratio of forced expiratory volume in first second of forced expiration and forced vital capacity i.e. FEV_1/FVC.

Psychiatric disorders contribute to the overall outcome of the patient as well as have their implication on the quality of life of the patients and their caregivers. The correlation and association of psychiatric morbidity in the caregiver and its impact on quality of life of the COPD patient will be studied.

In studies conducted in the US , it has been seen that clinical and sub clinical cases of COPD are associated with psychiatric co morbidities which are substantially attributable to the morbidity and mortality in patients of COPD. It also has an impact on the quality of life of the patient and the overall outcome.[8]

The patient with such chronic ailment also influences the quality of life of the care giver, especially spouses , in its physical, emotional, financial and social domains. Both the patient and the care giver have mutual influence on the quality of life of each other.[9]

There is paucity of the available data in Indian population regarding prevalence of psychiatric co-morbidities in patients of COPD and their caregivers and their subsequent impact on the quality of life in Indian population. Only a few studies till date in an Indian set-up discuss the interconnection, correlations and association of psychiatric diagnosis in a medical illness. Our study will assess the psychiatric co-morbidities in the patients, correlate it with the severity of the disease and study the impact on quality of life of the patients of COPD as well as their caregivers.

6.2 REVIEW OF LITERATURE

Chronic Obstructive Pulmonary Disease (COPD) is currently the fourth leading cause of death in the world but is projected to be the 3rd leading cause of death by 2020. COPD is a major cause of chronic morbidity and mortality throughout the world; many people suffer from this disease for years, and die prematurely from it or its complications.[1]

The authors of the **Global Burden of Disease (GBD) Study** designed a method to estimate the fraction of mortality and disability attributable to major diseases and injuries using a composite measure of the burden of each health problem: the Disability-Adjusted Life Year (DALY). In 2005 COPD was the eighth leading cause of DALYs lost across the world but by 2013 COPD was ranked as the fifth leading cause of DALYs lost.[10]

In a study by **Alexopoulos et al** , they found that causes of depression and anxiety symptoms in people with COPD are multifactorial and include behavioral, social and biological factors.[11]

Cognitive behavioral therapy and mind-body interventions (e.g., mindfulness-based therapy, yoga, and relaxation) can reduce anxiety and depression and mind-body interventions also improve physical outcomes such as lung function, dyspnea, exercise capacity and fatigue in people with COPD and psychological problems.[12]

Another study by **Mullerova et al** assessed that anxiety and depression are important co-morbidities in COPD and both are associated with a poor prognosis, younger age, female sex, smoking, lower FEV1, cough, higher SGRQ (St. George's Respiratory Questionnaire) score, and a history of cardiovascu-

lar disease.COPD is very common in patients with other psychiatric illnesses, often under-diagnosed and treated.[13,14]

In an Indian study conducted by **Sharma *et al.*** ,the prevalence of psychiatric comorbidity was estimated to be around 44.8% as compared to 24.3% in controls by using Global Mental Health Assessment Tool-Primary Care version. The most prevalent psychiatric comorbidity was anxiety disorders. The prevalence of depression as observed by Sharma *et al.*was 13.2%.However, studies from other countries reported the prevalence of depression in patients with COPD varying from 6% to 56%. Another important finding from the study by Sharma-et-al is that the strength of the association between anxiety and pulmonary-specific COPD symptoms appears to vary by functional capacity. The association of anxiety on shortness of breath and frequency of COPD symptoms was greater among patients who demonstrated lower functional capacity. [16]

Maurer *et al.* also found a prevalence of depression in COPD patients to vary from 10% to 42%.[17]

The study by **Kahraman *et al.*** found that the prevalence of anxiety in COPD patients was 30.7% as compared to 16.4% in controls by using Hospital Anxiety and Depression Scale. The prevalence rates of anxiety in patients with COPD ranges between 10% and 19% in patients with stable disease.[18]

In the study by **Yohannes et al 2006** , they concluded that co-morbid symptoms of anxiety and depression are common in patients with chronic obstructive pulmonary disease (COPD) and cause a number of negative effects. [19]

Compared with non-depressed COPD patients, COPD patients with elevated depression scores show lower health related quality of life **(Mikkelsen et al**

2004; Yohannes et al 2006; Ng et al 2007), a lower level of functioning, longer and more frequent hospital stays.[20]

The reported prevalence rates for co-morbid symptoms of depression or anxiety are highly variable ranging from 96% and 79%, respectively **(Borak et al 1991; Hynnien et al 2005)**.[21]

It is well documented that caregivers of patients with other severe and life-threatening somatic diseases may encounter comparable psychosocial and emotional distress as the patients themselves **(Kim et al 2000; Kanervisto et al 2007; Pinto et al 2007)**.[22]

In two studies, the caregivers of COPD patients reported levels of loneliness and depressive mood comparable to the levels reported by the patients themselves (**Keele- Card et al 1993; Kara et al 2004**).[23]

Balcells and colleagues showed that the association between anxiety and depressive symptoms on health-related quality of life (as measured by the St. George's Respiratory Questionnaire) was stronger among patients with severe to very severe COPD than among those with mild to moderate COPD symptoms.[24]

Hajiro and colleagues showed that anxiety was correlated with health-related quality of life only among patients with moderate to severe COPD symptoms. The exclusion of patients with more severe COPD may have precluded the ability to observe a significant association between FEV1, anxiety, and pulmonary symptoms. Given that anxiety and depressive symptoms are both correlated to pulmonary-specific symptoms among patients with COPD and that functional capacity appears to moderate the association between

anxiety and pulmonary symptoms, there is a need for treatments that reduce the anxiety characteristic of many COPD patients.[25]

To our knowledge, there have been no studies on the prevalence of mental disorders in caregivers of COPD patients especially in Indian population, even though their state of health may be of particular importance for the supportive care of patients. Higher levels of anxiety and depression are associated with elevated levels of pulmonary-specific symptoms among individuals with COPD, including fatigue, shortness of breath, and frequency of COPD symptoms. These associations remained significant even after adjustment for background characteristics and potential confounders, such as age, gender, BMI, smoking status, medical co-morbidities, and short-acting beta agonist, anti-depressant, and anxiolytic medications.

6.3 AIMS AND OBJECTIVES OF THE STUDY

To assess the prevalence of psychiatric co-morbidities and the impact on the quality of life in COPD patients and their caregivers. The association will be correlated to the severity of COPD (based on Global Initiative against Obstructive Lung Disease (GOLD) guidelines 2018)- GOLD 3 and 4 patients.

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7. MATERIALS AND METHODS

7.1 Source of Data

The diagnosed cases of COPD- GOLD 3 or 4 and their caregivers will be included from the outpatient and inpatient department of General Medicine and Pulmonary Medicine of Dayanand Medical College & Hospital, Ludhiana, after taking an informed written consent both from the patient and the caregiver.

7.2 METHOD OF COLLECTION OF DATA

This hospital based, cross-sectional study will be conducted in Dayanand Medical College & Hospital, Ludhiana. A total of 100 COPD patients- GOLD 3 or 4 and caregivers of the patients will be included in the study.

INCLUSION CRITERIA

- Age between the range 25-70 years.
- diagnosed cases of COPD based on Global Initiative against Obstructive Lung Diseases 2018 guidelines (GOLD) 3 or 4 i.e. severe or very severe (FEV1 between 30-50% or <30 % of predicted respectively)

EXCLUSION CRITERIA-

- Who are below 25 years or above 70 years of age
- Who do not consent for the study
- Who have a primary psychiatric illness

DURATION OF STUDY

18 months

TOOLS

1. **Mini International Neuropsychiatric Interview questionnaire** for the assessment of the psychiatric co-morbidities. The Mini-International Neuropsychiatric Interview (M.I.N.I.) version 5.0.0 is a short structured diagnostic inter-

view, developed jointly by psychiatrists and clinicians in the United States and Europe, for DSM-IV and ICD-10 psychiatric disorders. It is divided into 16 modules-identified by letters, each corresponding to a diagnostic category. With an administration time of approximately 15 minutes, it was designed to meet the need for a short but accurate structured psychiatric interview for multi-center clinical trials.

2. The quality of life will be assessed by **WHO-Quality of Life Assessment – BREF scale.** It consists of 26 items. Each item uses a Likert-type five-point scale. These items are distributed in four domains. The 4 domains of QOL are:-

(a) physical health and level of independence (seven items assessing areas such as presence of pain and discomfort; dependence on substances or treatments; energy and fatigue; mobility; sleep and rest; activities of daily living; perceived working capacity).

(b) psychological well being (eight items assessing areas such as affect, both positive and negative self concept, higher cognitive functions, body image and spirituality).

(c) social relationships (three items assessing areas such as social contacts, family support and ability to look after family; sexual activity).

(d) environment (eight items assessing areas such as freedom; quality of home environment; physical safety and security and financial status; involvement in recreational activity; health and social care:quality and accessibility).

Domain scores are scaled in a positive direction (higher scores denote higher quality of life). The mean score of items within each domain is used to calcu-

late the domain score. Mean scores are then multiplied by 4 in order to make domain scores comparable with the scores used in the WHOQOL-100.

3. **Socio demographic proforma** will include the name of the patient, age, gender, MRD number, occupation, education, income, marital status, duration of COPD, grade/severity, history of smoking, address, contact number, psychiatric co-morbidity ; name, age, gender, relation of the caregiver, duration of living together, contact number, score on WHOQOL-BREF.

OUTCOME

To assess the prevalence of psychiatric co-morbidities and the impact on the quality of life of COPD patients and their caregivers. The association will be correlated to the severity of COPD (based on Global Initiative against Obstructive Lung Disease (GOLD) guidelines 2018)- in GOLD 3 or 4 Patients.

Statistical Analysis

Data will be described in terms of range; mean ± standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variables will be done using Student t-test and Mann Whitney *U* test for independent samples for parametric and non-parametric data respectively. For comparing categorical data, Chi square ($\chi 2$) test will be performed and exact test will be used when the expected frequency is less than 5. A probability value (*p* value) less than 0.05 will be considered statistically significant. All statistical calculations were done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

No

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith

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Socio Demographic Proforma

PATIENT PROFILE S. NO.

NAME: AGE/SEX:

MRD NO:

OCCUPATION:

EDUCATION:

INCOME:

MARITAL STATUS:

DURATION OF COPD:

GRADE/ SEVERITY(DATE ; FEV1)

HISTORY OF SMOKING:

MONTHLY HOSPITAL EXPENSES:

ADDRESS:

CONTACT NO.:

PSYCHIATRIC CO-MORBIDITY IF ANY (ASSESSED BY M.I.N.I)

SCORE (WHOQOL BREF):

CAREGIVER PROFILE

NAME:

AGE/SEX:

RELATIONSHIP:

DURATION OF LIVING TOGETHER:

CONTACT NO.:

PSYCHIATRIC CO-MORBIDITY IF ANY(ASSESSED BY M.I.N.I)

SCORE (WHOQOL BREF):

Signature of Supervisor **Signature of Candidate**

Mini Neuro-Psychiatric Interview

Patient Name MRD No:-

MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV	ICD-10
A. MAJOR DEPRESIVE EPISODE	Current (past 2 weeks) Recurrent		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
MDE WITH MELANCHOLIC FEATURES	Current (2 weeks)		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
B. DYSTHYMIA	Current (Past 2 years)		300.4	F34.1
C. SUICIDALITY	Current (Past Month) Risk: Low Medium High			
D. MANIC EPISODE	Current Past		296.00-296.06	F30x-F31.9
HAYPOMANIC EPISODE	Current Past		296.80-296.89	F31.8-F31.9/F34.0
E. PANIC DISORDER	Current (Past Month) Lifetime		300.01/300.21	F40.01-F41.0
F. AGORAPHOBIA	Current		300.22	F40.00
G. SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)		300.23	F40.1
H. OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)		300.3	F42.8
I. POSTTRAUMATIC STRESS DISORDER Optional	Current (Past Month)		309.81	F43.1
J. ALCOHOL DEPENDENCE ALCOHOL ABUSE	Past 12 Months Past 12 Months		303.9 305.00	F10.2x F10.1
K. SUBSTANCE DEPENDENCE (Non-alcohol) SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months Past 12 Months		304.00-90/305.20-90 304.00-90/305.20-90	F11.1-F19.1 F11.1-F19.1
L. PSYCHOTIC DISORDERS	Lifetime Current		295.10-295.90/297.1/ 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29
MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime Current		296.24/296.34/296.4	F32.3/F33.3/ F30.2/f31.2/f31.5 F31.8/F31.9/F39
M. ANOREXIA NERVOSA	Current (Past 3 Months)		307.1	F50.0
N. BULIMIA NERVOSA	Current (Past 3 Months)		307.51	F50.2
ANOREXIA NERVOSA, BINGE EATING/ PURGING	Current		307.1	F50.0
O. GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)		300.02	F41.1
P. ANTISOCIAL PERSONALITY DISORDER Optional	Lifetime		301.7	F60.2

Signature of Supervisor **Signature of Candidate**

WHO Quality of Life BREF

Patient Proforma

Patient Name:- MRD No:-

	Equations for computing domain scores	Raw score	Transformed scores*	
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=	4-20	0-100
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

Care Giver Proforma

Caregiver Name:-

	Equations for computing domain scores	Raw score	Transformed scores*	
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=	4-20	0-100
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

Signature of Supervisor **Signature of Candidate**

Mini Neuro-Psychiatric Interview

Caregiver Name: Relation:

MODULES	TIME FRAME	MEETS CRITERIA	DSM-IV	ICD-10
A. MAJOR DEPRESIVE EPISODE	Current (past 2 weeks) Recurrent		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
MDE WITH MELANCHOLIC FEATURES	Current (2 weeks)		296.20-296.26 Single 296.30-296.36 Recurrent	F32x F33x
B. DYSTHYMIA	Current (Past 2 years)		300.4	F34.1
C. SUICIDALITY	Current (Past Month) Risk: Low Medium High			
D. MANIC EPISODE	Current Past		296.00-296.06	F30x-F31.9
HAYPOMANIC EPISODE	Current Past		296.80-296.89	F31.8-F31.9/F34.0
E. PANIC DISORDER	Current (Past Month) Lifetime		300.01/300.21	F40.01-F41.0
F. AGORAPHOBIA	Current		300.22	F40.00
G. SOCIAL PHOBIA (Social Anxiety Disorder)	Current (Past Month)		300.23	F40.1
H. OBSESSIVE-COMPULSIVE DISORDER	Current (Past Month)		300.3	F42.8
I. POSTTRAUMATIC STRESS DISORDER Optional	Current (Past Month)		309.81	F43.1
J. ALCOHOL DEPENDENCE ALCOHOL ABUSE	Past 12 Months Past 12 Months		303.9 305.00	F10.2x F10.1
K. SUBSTANCE DEPENDENCE (Non-alcohol) SUBSTANCE ABUSE (Non-alcohol)	Past 12 Months Past 12 Months		304.00-90/305.20-90 304.00-90/305.20-90	F11.1-F19.1 F11.1-F19.1
L. PSYCHOTIC DISORDERS	Lifetime Current		295.10-295.90/297.1/ 297.3/293.81/293.82/ 293.89/298.8/298.9	F20.xx-F29
MOOD DISORDER WITH PSYCHOTIC FEATURES	Lifetime Current		296.24/296.34/296.4	F32.3/F33.3/ F30.2/f31.2/f31.5 F31.8/F31.9/F39
M. ANOREXIA NERVOSA	Current (Past 3 Months)		307.1	F50.0
N. BULIMIA NERVOSA	Current (Past 3 Months)		307.51	F50.2
ANOREXIA NERVOSA, BINGE EATING/ PURGING	Current		307.1	F50.0
O. GENERALIZED ANXIETY DISORDER	Current (Past 6 Months)		300.02	F41.1
P. ANTISOCIAL PERSONALITY DISORDER Optional	Lifetime		301.7	F60.2

Signature of Supervisor **Signature of Candidate**

INFORMED PATIENT CONSENT

Date: _____

I……..D/o, W/o, S/o……. ……am willing to participate in the study **"PREVALENCE OF PSY-CHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

……. ……

Signature of the Witness Signature of the patient

Name:

Signature of Candidate **Signature of Supervisor**

फार्म अनुमति मरीज

तिथि_____

मैं_____ पत्नी/पुत्र/ पुत्री_____
निवासी_____ इस शोधकार्य"**PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CARE-GIVERS"** लिए के लेने भाग में शोधकार्य इस मैं हूँ। सहमत लिए के लेने भाग में करता पुष्टि मैं हूँ। तैयार से स्वेच्छा अपनी/ लिए के देने स्वीकृति यह की हूँ करती इस मुझे है। गया डाला दबाव ही न और गया दिया नहीं प्रलोभन आर्थिक कोई मुझे यह की है सविश्वा यह मुझे और है गया दिया कर स्पष्ट श्यउद्दे का शोधकार्य के जोखिम वाले होने में शोधकार्य इस मुझे है। लिए के लाभ के मानवता और विज्ञान है। मामुली बहुत जोखिम यह में समझ मेरी और है गया दिया समझा में बारे

अपनी समय भी किसी में सम्बन्ध के लेने भाग में धकार्यशो इस मैं सकता कर व्यक्त अस्वीकृति/ मेरे का करने व्यक्त अस्वीकृति मेरे और हूँ सकती पड़ेगा। नहीं प्रभाव कोई पर इलाज

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हस्ताक्षर के गवाह हस्ताक्षर के रोगी/ निशान का अंगूठे

नाम: नाम:

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अन्वेषक के हस्ताक्षर

_____

हस्ताक्षर के विद्यार्थी

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____

“PREVALENCE OF PSYCHIATRIC CO-MORBIDITIES AND THE IMPACT ON QUALITY OF LIFE IN COPD PATIENTS AND THEIR CAREGIVERS” ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਮਾਨਵਤਾ ਅਤੇ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਸਕਦਾ ਲੈ ਹਾਂ/ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

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ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

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ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

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ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ